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JANUARY 1989

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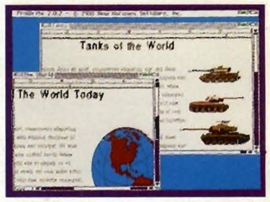
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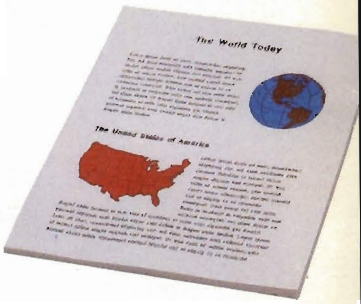
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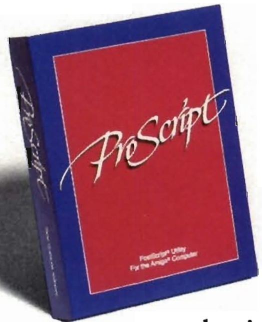
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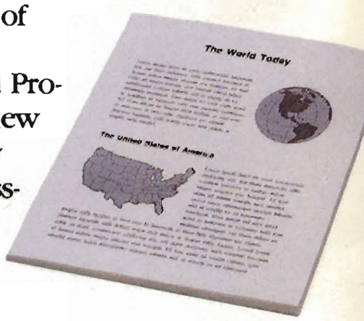
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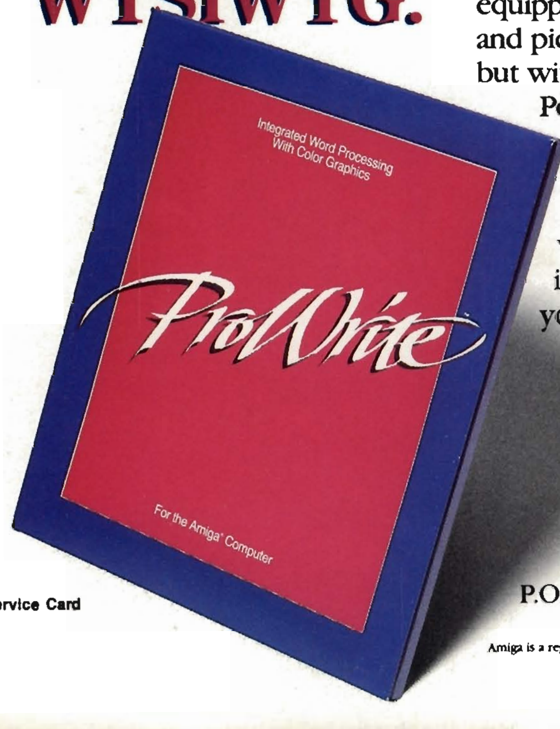


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Double Dragon is a joint publication of Arcadia and Tradewest.

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VIEW FROM THE BRIDGE

The covers of our last few issues provide one barometer of the Amiga's progress. November's and December's were generated on the Amiga by professional computer artists—and we were impressed at the time by the fact that a gifted individual could produce in a few hours on the Amiga what might take days using traditional methods. We still are. But this month's cover was created by Executive Editor Michael R. Davila, who, I promise you, couldn't draw flies. Thanks, however, to the Amiga and a new graphics program (see page 48), his lack of natural talent was no obstacle.

In the same way, developers are finding new methods every day for the Amiga to let people delve into music, moviemaking, financial management, and dozens of other areas to an extent that would otherwise be difficult if not impossible. We'll tell you about a few more of them in this month's *Scuttlebutt* (page 9) and *Reviews* (page 46) sections—and, of course, in every issue in the coming year.

In the rest of this month's issue:

• Any computer magazine can run a "Best Games of the Year" roundup, and most magazines do. But only we can tell you what's *Tops in Amiga Entertainment 1988* in the eyes of Arnie Katz, whose credentials as computer gaming's most respected reviewer are too well known to bear repeating. (Turn to page 29.)

• Bob Spirko's *Speech Set* program (August '88) elicited so much response that it took us several hours to answer the extra mail. But irony of ironies—no sooner had we licked the last stamp than we received from Bob a program that would have made our task easier. *Mailbox,* in this issue, provides a fast method of managing names and addresses and printing labels. (Turn to page 24.)

• The term "hue and cry" takes on a new meaning for users who've experienced the tedium of comparing shades of color on the Amiga. But with Tom Griffith's *Shade Select* you can call up any of the Amiga's 4096 colors, and compare up to ten onscreen at one time. (Turn to page 66.)

• If you're the operator of a small business, you know that beating the competition requires taking full advantage of every resource that's available to you. This month and every month in *Exec File*, Ted Salamone will tell you how your Amiga can help give you the edge you need. (Turn to page 74.)

We depend upon your feedback to determine the contents of each issue: how much space should be devoted to reviews, how much to programs, which new columns would you like to see started, which present columns would you like to see scuttled, etc. Send your letters to *Ahoy!'s AmigaUser*, Ion International Inc., 45 West 34th Street—Suite 500, New York, NY 10001. ***—David Allikas***



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ENLIGHTENMENT

This is no ordinary descent down . . . we're talking way down. To the world of the undead.

Yes, the evil Acamantor and his legion of undead are back. And our hero, Hasrinaxx the Druid, must destroy them once and for all. Trek through swampland, Caverns of Darkness, a poisonous land of fungus . . . just to name a few. . . to finally enter the five levels of Acamantor's dungeon. Then the action really gets hot!

SUPERB EFFECTS set this game apart from all others.

15 TREACHEROUS LEVELS test your skill time and time again.

32 DIFFERENT SPELLS while you control up to five characters at a time.

TWO-PLAYER OPTION lets you play alone or with a friend.

STARGLIDER

You're in command. You control the cockpit of an Airborne Ground Attack Vehicle (AGAV) on your invaded home planet, Novenia. An entire galaxy of blood-thirsty aliens is after you. You have to out-fight, out-fly, out-maneuver the enemy. With Starglider, you can!

Starglider brings together the reality of a flight simulator with an action-packed shoot 'em up arcade game. The graphics are so incredible, you'll experience a true feeling of flight.

HIGH SPEED ANIMATION and vivid vector graphics enable you to "fly" with amazing quickness and response time.

FAST-PACED ACTION—The skies are filled with flying craft, floating mines, missiles and laser beams.

STUNNING SOUND effects and digitized speech on the Amiga and Atari ST versions.

BLACK LAMP

Jolly Jack the Jester wants more from his boss (The King) than a few good laughs. He wants his daughter's hand in marriage. The King, of course, thinks Jack is truly jesting. But what the hey. If Jack can rid the Kingdom of a plague of evil beasties, Jack can have her. If he can't, Jack dies.

Outrageous? You bet. Black Lamp is a wonderful, witty once-upon-a-time tale that has earned rave reviews for its graphics, sound and superb quality.

EXTRAORDINARY ANIMATION with detailed backdrops makes Blacklamp a winner!

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ENLIGHTENMENT: Amiga $29.95. Commodore 64/128 $19.95. STARGLIDER: IBM $29.95. Amiga and Atari ST $24.95. Commodore 64/128 and Apple II $19.95. BLACK LAMP: Amiga and Atari ST $24.95. Commodore 64/128 $19.95.

SCUTTLEBUTT

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THE GOLD SCREEN

MovieSetter ($99.95) allows even novice animators to create action cartoon sequences, with stereo sound. The built-in movie-clip files can be used, or original 32-color images can be created. IFF graphics can also be imported from programs like *Deluxe Paint II* and *ComicSetter.* Color cycling, playback at up to 60 frames per second, and linear and elliptical guides make special animation effect possible. Via full video overscan, productions can be preserved on videotape. One megabyte is required.

Gold Disk, 416-828-0913 (see address list, page 17).

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CHRISTMAS SPIRIT

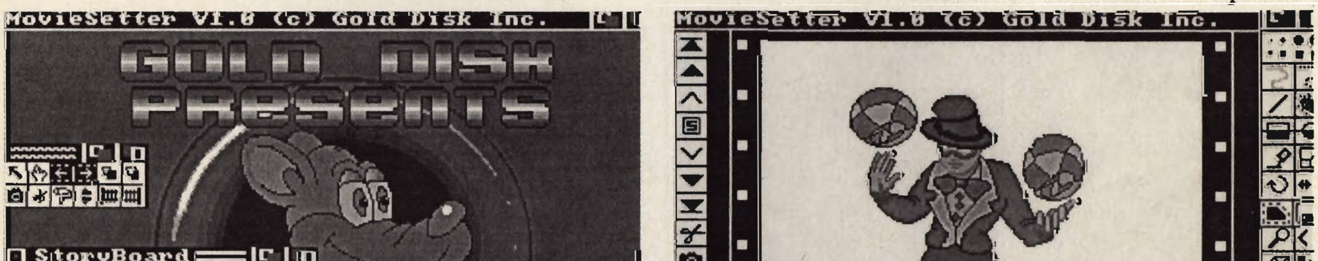
Christmas Classics ($14.95) plays twelve different carols while yuletide scenes and the words to the songs are displayed. Included are Deck the Halls, Jingle Bells, Rudolph the Red Nosed Reindeer, Up on the House Top, Silent Night, We Three Kings, O Holy Night, Away in a Manger, Frosty the Snowman, Jolly Old St. Nicholas, Santa Claus Is Comin' to Town, and O Christmas Tree.

Free Spirit Software Inc., 215-683-5609 or 800-552-6777 (see address list, page 17).

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MUSICAL NOTES

MidiVU ($29) is a multitasking musical scratch pad that will record one track in real time from any MIDI instrument. Occupying only 2% of a standard disk and requiring 3 seconds to load, the program is designed to let the musician record material spontan-



Top left: MovieSetter *screen with titlebar and several requesters. Top right: MovieClip editor lets you create and edit 32-color images within the program. Bottom left:* MovieSetter's *History feature shows the progression of objects laid down. Bottom right: the StoryBoard Requester lets you view segments of a several-minute long movie using only 1 meg.*

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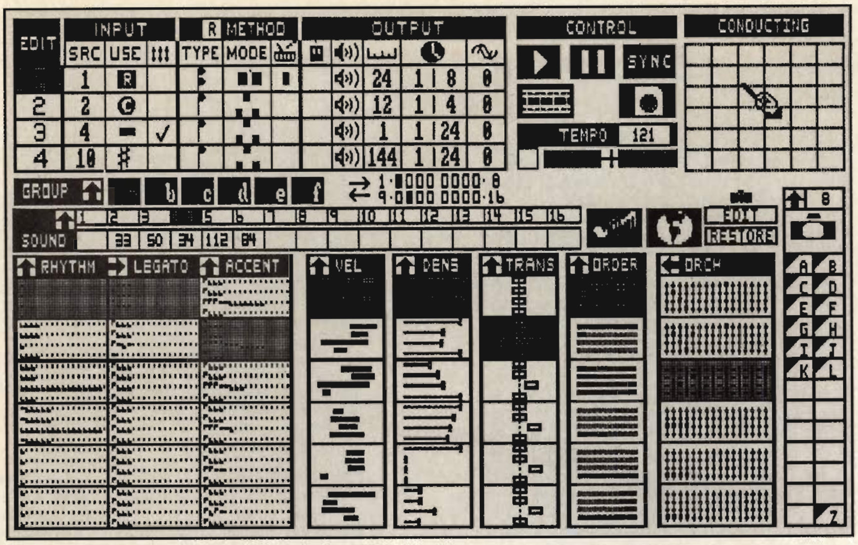
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Circle #175 on Reader Service Card



Main screen of* M*, a real-time, interactive composing/performing enrivonment.

eously and easily while using larger programs. It displays four buttons—Record, Stop, Play, and Loop—and offers a pop-up MIDI Monitor that permits you to display messages as they pass through the MIDI port (helpful as a learning tool, and for troubleshooting). Help screens display the MIDI 1.0 message definitions. Menu control of MIDI message filtering is also offered; and for self-accompaniment, sequence playback can be looped.

Diemer Development, 818-762-0804 (see address list, page 17).

Circle #118 on Reader Service Card

PRECISION ONLINE

Precision has established The Official *Superbase* Information Network (OSIN), an online technical assistance and discussion forum for users of *Superbase* and other Precision products, on the American People/Link network. As a service to Precision customers, American People/Link will waive its usual $15 registration fee and offer users special rates. OSIN subscribers will also have access to P/Link's other services, including E-mail, clubs, games, and on-line shopping. (Regular over-the-phone technical support remains available from Precision.)

At press time, Precision planned to have in place by November 30 a support program for individuals wishing to market their own applications based on *Superbase*. The Official *Superbase* Application Developer (OSAD) program will give developers access to proprietary information about *Superbase*, marketing assistance, and other necessary help.

Precision Incorporated, 214-929-4888 (see address list, page 17).

Circle #250 on Reader Service Card

FAX ON FILE

Users of CompuServe's EasyPlex and InfoPlex electronic mail services can now send messages directly from their computers to facsimile machines anywhere in the world, without having to produce a printed document first. Price within the 50 states is 75¢ for the first 1000 characters and 25¢ for each additional 1000 characters (50,000 character limit on EasyPlex). International prices are based on destination country and length of message.

CompuServe, 614-457-8600 (see address list, page 17).

Circle #257 on Reader Service Card

M ON THE AMIGA

Just adapted to the Amiga following release on the Macintosh, Atari, and IBM, *M* ($200) is a real-time interactive composing and performing environment that lets the user shape or change any aspect of a composition while hearing it. After specifying notes and chords, the musical material can be transformed by clicking on various screen controls to specify rhythm, articulation, orchestration, and many other variables. Music composed with *M* can also be performed live with the program, either by manipulating screen controls, playing control keys on a MIDI keyboard, or moving the mouse in a Conducting Grid.

The program can automate changes in MIDI velocities, note densities, rhythms, legato-staccato articulations, and accents. The user can instruct *M* to reorder notes and selectively randomize what notes are played back. Then, *M* intelligently chooses what notes are played, giving the music an improvisatory feel. For users with MIDI equipment, the program has MIDI file compatibility with other music software.

One megabyte is required; a second disk drive is recommended.

Intelligent Music, 518-434-4110 (see address list, page 17).

Circle #251 on Reader Service Card

BACKUP UPDATE

Version 2.0 of *Quarterback*, Central Coast's hard drive backup program, can back up a hard disk to any AmigaDOS file-structured device which has a standard mountlist entry (including C Ltd's Konica 10.7MB high-density floppy drive, Inner Connection's Bernoulli drive, and CSA's streaming tape drive). Archive/restoration reports can now be given user-defined names and be written to any user-defined subdirectory; report page size is now taken from the Preferences settings; backup/restore device names are saved in the *Quarterback* parameter file; and the *Quarterback* window now opens to the full size of the Amiga screen. Current users can get the update by sending a check or money order for $15.00 plus their *Quarterback* master disk.

Central Coast Software, 805-528-4906 (see address list, page 17).

Circle #242 on Reader Service Card

DO IT YOURSELF

Digitronics now offers their four megabyte RC4 Ramcard and A500 Adapter in kit form for individuals who can do some simple soldering and have access to the parts not included.

The RC4 Kit ($100) includes a blank PC board, 4 resistor packs, instructions and schematics, 5 preprogrammed PALs, a 5-tap delay line, and software. You'll have to buy assorted capacitors, resistors, and chips.

The A500 Adapter Kit ($70) consists of case, 86-pin edge card connector, relay, instructions, blank printed circuit board, 100-pin edge card connector, DIN power connector, and screws; you must add a 5-volt 1.5 amp supply and

Circle #293 on Reader Service Card →

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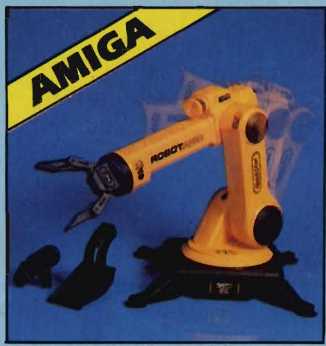
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Star's 24-wire NX-2400 Multi-Font offers four resident fonts, 360 by 360 dpi graphic resolution, 170 cps draft mode, and 7K buffer (expandable to 39K).

a 74F86 chip.

The components provided are guaranteed, but neither kit carries a warranty covering the operation of the final product when assembled.

Digitronics, 215-459-4493 (see address list, page 17).
Circle #243 on Reader Service Card

PHOTON PAINT 2.0

Due for release around December 1, Photon Paint 2.0 adds such features as contour mapping, multiple swap pages, alternative drawing sources like rubthrough and Pantograph, definable air brush, gradient color spreads, and shadowing with adjustable size and offset.

MicroIllusions, 818-360-3715 or 800-522-2041 (see address list, page 17).
Circle #249 on Reader Service Card

BUSINESS PRINTER

Designed for business correspondence, the 24-wire NX-2400 Multi-Font ($529) prints at 170 cps in draft elite mode and 57 cps in letter quality elite mode. In addition, the printer offers a 360 by 360 dpi graphics resolution. The standard 7K buffer can be expanded to 39K with an optional 32K RAM card. The four resident fonts are Courier, Prestige, Orator, and Script; three more (Letter Gothic, Blippo, and OCR B) can be had through optional font cards. Italic printing is available for all fonts and pitches. The front panel offers selection of paper park and other printer features, including type style, print pitch, form feed, and quiet mode.

Star Micronics, 212-986-6770 (see address list, page 17).
Circle #258 on Reader Service Card

WORDPERFECT NEWS

The *WordPerfect* library, scheduled to be in stores at least a month before you read this, offers five integrated programs to help you put your chaotic life in order—Calendar (keep track of appointments, create memos and to-do lists, and set an alarm), Notebook (organize information into records in single line or index card format), Calculator (with financial, programming, and scientific functions), File Manager (create, delete, display, or print files and directories), and a Program Editor (create and edit text, batch, and program files).

In addition, WordPerfect has extended until December 31, 1988 their promotion originally scheduled to run through September. Under the terms of the offer, members of Amiga user groups throughout the United States can buy the word processor for $155, a savings of $174 off the $329 list price. You must show proof of Amiga user group membership, and your order must be accompanied by a user group purchase agreement, available from WordPerfect.

WordPerfect Corporation, 801-255-5000 (see address list, page 17).
Circle #237 on Reader Service Card

3-D MODELING

The *Design-3D* modeling package ($99.95) is intended to meet the needs of artists, architects, and engineers, while remaining easily accessible to the hobbyist. You can model in wire frames with 6 line types and 16 colors (with dithering to emulate additional colors). Top, side, front, and perspective views are provided, with four light sources. Axial extrusion allows for speedy modeling of symmetrical objects. The program supports 3-D text (fonts and font editor included). You may work in hi-res, interlace, or non-interlace, in any unit of measure—inches, centimeters, etc. The ANIM format is supported for importing images into PageFlipper Plus or animating within the program in real time. One megabyte is required.

Gold Disk, 416-828-0913 (see address list, page 17).
Circle #260 on Reader Service Card

TITLER

The *Broadcast Titler* character generator ($299.95) eliminates "jaggies" with an effective resolution of 2160 by 1440. A library of customized, high-definition video fonts is included; in addition, all Amiga Fonts and Color Fonts are accepted. 320 hi-res colors from a 4096-color palette are possible per page, with 16 separate colors for each line of text and graphics. Colorful automatic backgrounds and patterns are provided, along with over 100 page and line transitions (peel, tumble, roll, flip, etc.). Up to 1000 pages of text and graphics storage are possible. 1½ megabytes are required.

InnoVision Technology, 415-538-8355 (see address list, page 17).
Circle #261 on Reader Service Card

CUBE ROOTS?

I.C.E. ($89.95), the Integrated Calculation Engine, provides an environment for creating customized programable calculation engines. Math, financial, statistical, logical, trigonometric, and engineering functions can be

mixed. Hex, decimal, and binary number systems are supported, as well as function and statistical plotting windows, text handling, and integer approximation. Entire calculation sequences can be assigned to one key. The program works from CLI or Workbench, with proper multitasking.

King Publishing, 712-252-4604 (see address list, page 17).
Circle #240 on Reader Service Card

ANOTHER COAT

The fourth upgrade of *Express Paint* since PAR introduced the drawing program last year, Version 3.0 ($139.95) adds virtual pages (create a picture of any size and with any number of colors without running out of chip memory), unlimited undos (backtrack past as many changes as you wish, then re-



3.0 adds virtual pages, 3-D, more.



Record, play, edit sequencer data.

do a selective group of the undone changes), and 3-D perspective. Other new features include support for C Ltd.'s LaserXpress printer, color cycling, 3-D antialiasing tools, gradient fills, zoom in or view full page, the saving of IFF images as icons, and stepping through and saving color-cycled images. 512K RAM is required.

Brown-Wagh Publishing, 408-395-3838 (see address list, page 17).
Circle #236 on Reader Service Card

MIDI MAGIC

The *MIDI Magic* sequencer ($149.95) provides a basic studio setup that gives the Amiga the capability to record, play back, edit, and organize the MIDI data generated by an electronic sequencer. Though capable of running concurrently with other Amiga programs, *MIDI Magic* ensures uninterrupted music output by assigning



Pro*Sound Designer, ***Gold Edition, a digitizing, processing, and playback system, uses a special hardware adapter to achieve a full 1-32 KHz frequency response range.***

the system's top priority to music. Features include multichannel simultaneous recording, 480 PPQN resolution, 4-mode quantization, and multiple time signatures. Realtime, modular, and step editing are permitted. Any type of synthesized, sampled, or live sounds can be recorded onto 16 tracks with up to 26 sequences. The user interface works like a tape recorder, with Play, Record, Pause, Rewind, and Fast Forward controls. A minimum of 512K is required, as well as a MIDI interface, synthesizer, and appropriate cables.

Brown-Wagh Publishing, 408-395-3838 (see address list, this page).

Circle #238 on Reader Service Card

STOCK WATCHER

The Securities Analyst ($79.95) permits the individual investor to chart any number of stocks over an extended period of time, and make intelligent buy-sell decisions based on market trends. Available forms of analysis include Moving Average, Accumulation/Distribution, Relative Strength, Performance, Point & Figure, Trailing Stops, Stock Chart, Momentum, Price/Earnings Analysis, and Performance Analysis. Results can be displayed on the screen or output to the printer.

Included is "A Technical Analysis of Stock Market Trends," a manual providing a comprehensive background in trend analysis for investors.

Free Spirit Software Inc., 215-683-5609 or 800-552-6777 (see address list, this page).

Circle #241 on Reader Service Card

DIGITIZER

*Pro*Sound Designer, Gold Edition* is a complete digitizing, processing, and playback system. A specially designed hardware adapter that uses second generation sound digitizing technology endows the program with a full 1-32 KHz frequency response range. Automatic gain control facilitates digitizing and insures a high level of clarity. The program can record, edit, and manipulate up to four sound samples at once. Additional features include cut, paste, overlay, and a facility for easily changing frequencies and octaves.

Also included is an extra disk containing *MIDI-Plus* software which permits samples recorded with *Pro*Sound Designer* to be played back as an instrument voice on a MIDI keyboard, or on the Amiga. The module allows up to 10 samples in memory at a time, and gives the user full control over how, and which part of a given sound sample is played.

Price of the two disks is $159.95; however, for a limited time Precision will extend a $50 price reduction in exchange for your current sound digitizer.

Precision Incorporated, 214-929-4888 (see address list, this page).

Circle #248 on Reader Service Card

DR AND MRS

MRS (MIDI Recording Studio) V. 1.1 from Dr. T is an automated 8-track recorder featuring a mouse-driven user interface. It features full editing of all MIDI parameters and supports the Amiga's internal IFF sampled sounds. The fully multitasking application lets you mute/unmute tracks using the mouse in real time, as well as cut, copy, paste, transpose, compress, expand, and scale velocity on a single event or range basis. Tempo adjustment can be made in real time or programmed. Data files are compatible with Dr. T's *KCS* and *Copyist.*

Dr. T's Music Software, 617-244-6954 (see address list, this page).

Circle #245 on Reader Service Card

Companies Mentioned in Scuttlebutt

For more information about products listed in *Scuttlebutt*, contact these companies directly—or save time and money by circling the corresponding numbers on the Reader Service Card bound between pages 50 and 51.

ASDG Inc.
925 Stewart Street
Madison, WI 53713
Phone: 608-273-6585

Anco Software
P.O. Box 292
Burgettstown, PA 15021
Phone: 412-947-3922

Broderbund
17 Paul Drive
San Rafael, CA 94903
Phone: 415-492-3200

Brown-Wagh Publishing
16795 Lark Ave., Ste. 210
Los Gatos, CA 95030
Phone: 408-395-3838

Byte by Byte
Arboretum Plaza II
9442 Capital of Texas Hwy N., Suite 150
Austin, TX 78759
Phone: 512-343-4357

Celestial Systems
2175 Agate Court
Simi Valley, CA 93065
Phone: 805-582-0729

Central Coast Software
268 Bowie Drive
Los Osos, CA 93402
Phone: 805-528-4906

CompuServe
5000 Arlington Center Blvd.
P.O. Box 20212
Columbus, OH 43220
Phone: 614-457-8600

Computer Systems Assoc.
7564 Trade Street
San Diego, CA 92121
Phone: 619-566-3911

Dr. T's
220 Boylston Street
Chestnut Hill, MA 02167
Phone: 617-244-6954

Diemer Development
12814 Landale Street
Studio City, CA 91604-1351
Phone: 818-762-0804

Digitronics
P.O. Box 206
Villanova, PA 19085
Phone: 215-459-4493

Eagle Tree Software
P.O. Box 164
Hopewell, VA 23860
Phone: 804-452-0623

Epyx, Inc.
600 Galveston Drive
P.O. Box 8020
Redwood City, CA 94063
Phone: 415-366-0606

Free Spirit Software
P.O. Box 128
58 Noble Street
Kutztown, PA 19530
Phone: 215-683-5609

Gold Disk
P.O. Box 789
Streetsville, Mississauga
Ontario, Canada
L5M 2C2
Phone: 416-828-0913

Image Tech
9276 Adelphi Rd., Ste. 102
Adelphi, MD 20783
Phone: 301-439-1151

InnoVision Technology
P.O. Box 743
Hayward, CA 94543
Phone: 415-538-8355

Intelligent Music
116 North Lake Avenue
Albany, NY 12206
Phone: 518-434-4110

IntraCorp Inc.
14160 SW 139th Court
Miami, FL 33186
Phone: 305-252-9040

King Publishing
921-32nd Street
Sioux City, IA 51105
Phone: 712-252-4604

Knowledgeware
P.O. Box 2292
Paso Robles, CA 93446
Phone: 805-238-5233

Konami Inc.
815 Mittel Drive
Wood Dale, IL 60191
Phone: 312-595-1443

MicroDeal
576 S. Telegraph
Pontiac, MI 48053
Phone: 313-334-5700

MicroIllusions
17408 Chatsworth St.
Granada Hills, CA 91344
Phone: 818-360-3715

Precision Software
8404 Sterling St., Suite A
Irving, TX 75063
Phone: 214-929-4888

Psygnosis Ltd.
Port of Liverpool
Liverpool L3 1BY
United Kingdom
Phone: 051 207 0825

Star Micronics
200 Park Ave., Suite 3510
New York, NY 10166
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WordPerfect Corporation
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Orem, UT 84057
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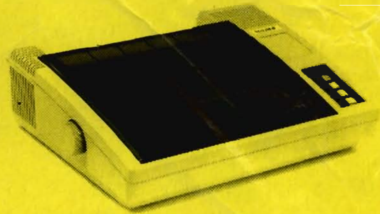
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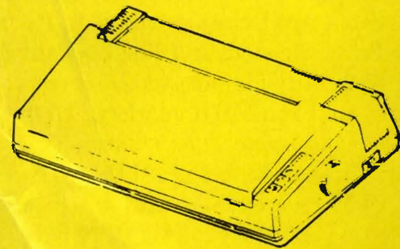
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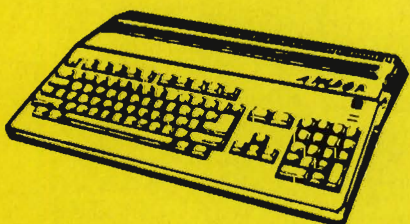
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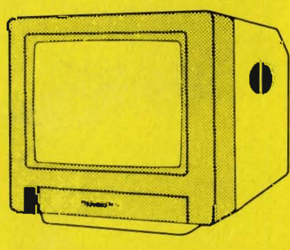
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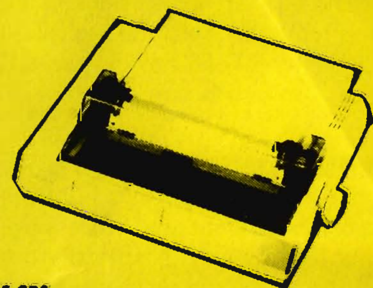
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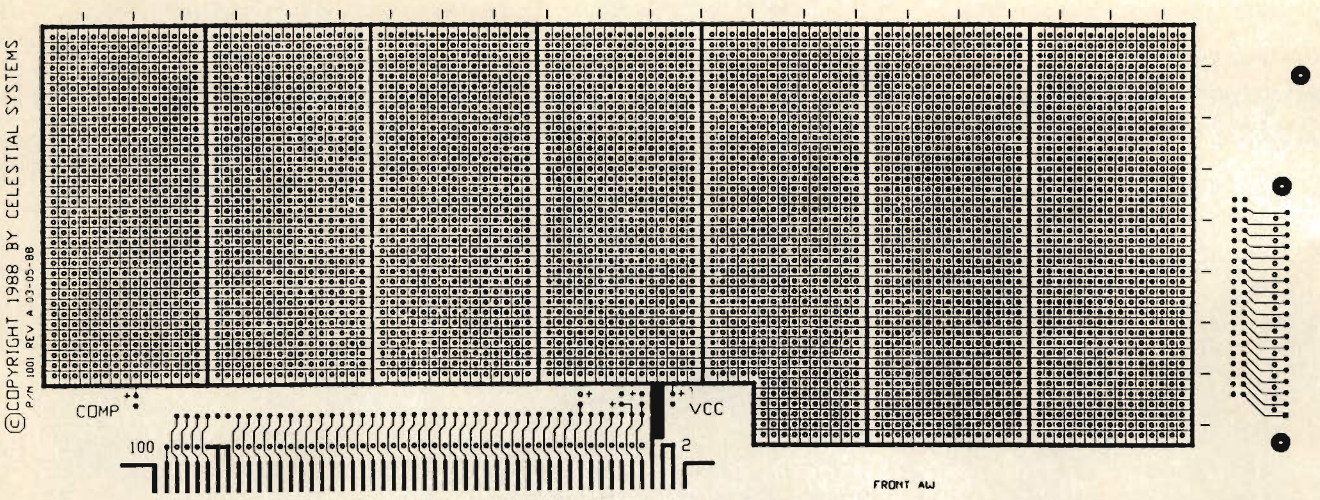
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Celestial Systems' prototyping board lets you build and test custom hardware before developing a printed board.

PROTOTYPING BOARD

Celestial Systems' prototyping board for the Amiga 2000 (and other Amiga computers with Zorro II expansion slots) allows developers, engineers, and hobbyists to build, test, and debug custom hardware before developing a custom printed circuit board. The two-sided board features over 4400 plated through holes on a 0.1" grid. The main prototyping area accepts IC's in dual in-line packages (DIPs), with as many as 64 pins and ICs in pin grid arrays as large as 14 x 14. Board and mounting bracket are available direct from Celestial Systems for $49.95 plus $3.00 shipping to any location in the continental US.

Celestial Systems, 805-582-0729 (see address list, page 17).
Circle #278 on Reader Service Card

COLOR CAPTURER

ASDG has begun shipping SpectraScan ($995), their system for performing hi-res full color image capture and manipulation on the Amiga 2000. The hardware/software package, which provides control over the Sharp JX-450 Color Scanner input system, corrects the principal weakness of Amiga-based desktop publishing: the lack of professional quality color input.

The SpectraScan package includes ASDG's Twin-X General Purpose Input/Output Board (available separately for $329), which utilizes the IEEE-488 high speed interface bus, and ASDG's SBX-GPIB module (available separately for $199), which adds GPIB capability to the Twin-X board. Also included are software drivers to allow general purpose control over the GPIB bus, SpectraScan software, internal and external cables, and manuals. Now for the bad news—the JX-450 scanner, also distributed by ASDG, sells for $6995.

Many DTP's can currently interface to SpectraScan and utilize some of its capabilities; in the future, *Professional Page* and other packages will be modified to work directly with the system to take full advantage of it.

ASDG Inc., 608-273-6585 (see address list, page 17).
Circle #239 on Reader Service Card

VIDEO TOOLS

Two additions to the *Photon Video* line of equipment for the Amiga video professional/advanced amateur:

The *Photon Video Time Code Generator* lets the Amiga generate longitudinal (SMPTE) time code, used to number the frames of your video to allow accurate editing and synchronization. Availability: December 1.

The *Photon Video Edit Decision List Processor* lets you create an industry-acceptable edit decision list that can be delivered to the editor as hard copy, or transferred from disk to the edit controller. Scheduled for availability in late January.

MicroIllusions, 818-360-3715 or 800-522-2041 (see address list, page 17).
Circle #247 on Reader Service Card

RAM ACCELERATOR

With Kickstart 1.2.2 in EPROM, Computer Systems Associates' DragStrip RAM accelerator lets your Amiga 2000 perform screen updates and hard drive access at four times the speed of Kickstart 1.2 in the standard Amiga. DragStrip interfaces directly to CSA's 68020/68030 CPU board via their proprietary 32 bit V-Bus, making it possible to avoid the expense of 32 bit RAM in utilizing CSA's processor boards. (The 020 and 030 chips can access up to 4 Gigabytes of 32 bit RAM.) DragStrip is designed to use standard 16 bit DRAM boards.

Computer System Associates, 619-566-3911 (see address list, page 17).
Circle #274 on Reader Service Card

STORYBOARD MAKER

VIVA (Visual Interfaced Video Authoring) lets the user combine the supplied icons and sounds into storyboard-style presentations. Drawings, charts, and digitized pictures can be integrated into the presentation, and standard or custom text fonts can be used in text screens. Modular authoring is possible: i.e., one storyboard can call up another.

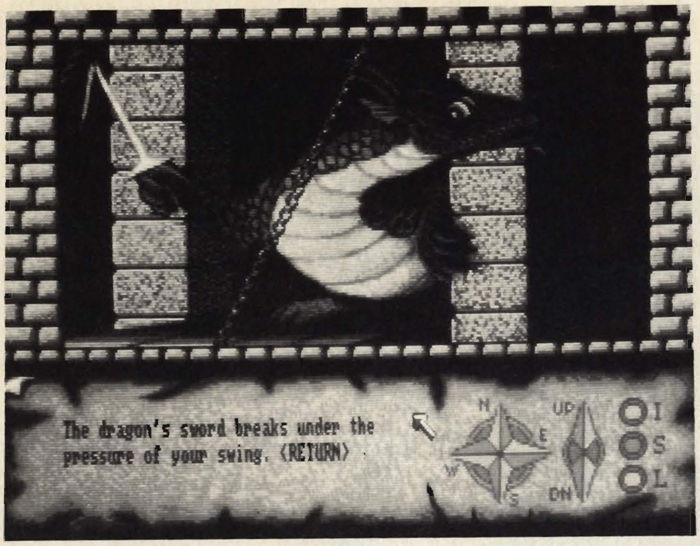
Knowledgeware, 805-238-5233 (see address list, page 17).
Circle #275 on Reader Service Card

GATEWAY

Gateway ($49.95) replaces Workbench and CLI, allowing the user to point and click on filenames instead of typing. It is AmigaDOS-compatible, and can be used concurrently with Workbench and/or CLI. Its size—up to 60K smaller than Workbench—allows for easier multitasking.

Image Tech, 301-439-1151 (see address list, page 17).
Circle #276 on Reader Service Card

Circle #294 on Reader Service Card →



Dungeon Quest's ***language interpreter lets the player "talk" with the game, saving the hassle of puzzling over the interface or searching for the proper word.***

RECHISELED

Sculpt-Animate 4D ($499.95) features a refurbished requester that displays much more information; new commands like Grid (which causes all three windows of the triview to be cubically partitioned, allowing for exact vertice placement), Protractor (for accurate angles), and Helix (for creating complicated spiral 3-D objects like the threads of a screw); assignable hot keys; improved rendering characteristics that result in better looking ray-traced images; and a fast Scanline capability that makes it possible to render a full animation in hours that would ordinarily take days.

Byte by Byte, 512-343-4357 (see address list, page 17).

Circle #277 on Reader Service Card

GAMES

Coming from Konami are *Jackal* (1st quarter '89), *Blades of Steel* (4th quarter '89), and *The Adventures of Bayou Billy* (4th quarter '89). No details about any of the games are yet available.

Konami Inc., 312-595-1443 (see address list, page 17).

Circle #279 on Reader Service Card

From Image Tech:

First in the company's promised series of Ancient Games, *Kikugi* ($29.95) translates the Japanese contest of concentration and strategy to the computer screen. The gameplay consists of simply jumping and removing marbles, but each move you make limits the number of remaining moves, making each additional move more and more critical.

In addition to state of the art graphics, *Dungeon Quest* utilizes stereo sound, an intuitive interface, and a language interpreter that allows you to "talk" with the game.

Image Tech, 301-439-1151 (see address list, page 17).

Circle #280 on Reader Service Card

Distant Armies ($44.95) lets the user enjoy chess in many of its historical variations, from its beginnings in India through versions played in the Orient, Europe, and elsewhere. In all, 10 different contests are included, offering both two and three dimensional views. Complete rules and history are offered via a help file and a glossary.

Eagle Tree Software, 804-452-0623 (see address list, page 17).

Circle #281 on Reader Service Card

From MicroDeal, each $39.95:

Tetra Quest begins at the First Galactic Games, for which the greatest athletes of every known world have gathered. But the legendary Phoebus Tablets, without which the games cannot begin, have been stolen by the inhabitants of the TetraDome. Phoebus offers to bestow his power upon anyone brave enough to enter the TetraDome to retrieve the tablets.

International Soccer lets you control conditions like the weather, shadows, and winds. One or two players can compete; or, with an optional adapter (available from MicroDeal for $14.95), up to four joysticks can be connected at a time.

Fright Night is based upon the tooth-in-cheek vampire film of the same name, pitting teenagers against their bloodsucking neighbor.

MicroDeal, 313-334-5700 (see address list, page 17).

Circle #282 on Reader Service Card

Designed for Broderbund by Maxis Software, *SkyChase* ($39.95) lets flight simulator fans choose from a fleet of seven: the FA/18 Hornet, F-14 Tomcat, F-15 Eagle, F-16 Falcon, MIG-31 Foxhound, MIG-27 Flogger, and for comic relief, a paper airplane. If you play against the computer, you can choose Easy Mode or Ace Mode; if you challenge a friend, the settings can be adjusted so that you're perfectly matched.

Broderbund, 415-492-3200 (see address list, page 17).

Circle #283 on Reader Service Card

Deriving its name from the Atlantic City casino, *Trump Castle* ($39.95) includes black jack, roulette, craps, keno, video poker, and nine different slot machines. Included in each package are $250 worth of discount coupons for use at the hotel and casino.

IntraCorp, 305-252-9040 (see address list, page 17).

Circle #113 on Reader Service Card

Coming from Anco are the *Highway Hawks* racing game ($34.95) and *Pinball Master* ($24.95).

Anco Software, 412-947-3922 (see address list, page 17).

Circle #114 on Reader Service Card

The latest in Epyx's Master's Collection of software for the advanced gamer, *Space Station Oblivion* ($49.95) is set on Mitral, a moon of the planet Evath. There, banished felons who mine for precious minerals have released poisonous vapors that threaten to destroy Mitral and throw Evath out of orbit. To avert this catastrophe you, a member of the Driller Federation of Evath, must place a drill in each of Mitral's 18 different sectors to release the hazardous vapors.

Epyx, 415-366-0606 (see address list, page 17).

Circle #115 on Reader Service Card

In *Baal* you lead an elite force of Time Warriors in search of a war machine that has been stolen and hidden by the god of evil. Each of the three domains you enter is filled with demons and beasts that were created to kill or be killed. If you can find and assemble the 18 separate components of the machine, you must defeat Baal himself.

Psygnosis (see address list, page 17).

Circle #116 on Reader Service Card

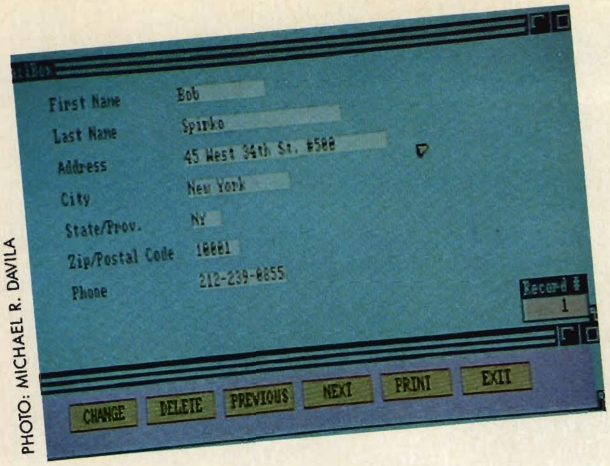


PHOTO: MICHAEL R. DAVILA

MAILBOX

Zippy Code for Name and Address Management

By Bob Spirko

Although BASIC does not normally provide a suitable environment for databases, Amiga BASIC (along with the speed of the Amiga) does supply the necessary power for such a utility, and *Mailbox* is just the program to demonstrate this.

Mailbox provides an easy way to keep a record of names and addresses and print mailing labels. Most of the commands are mouse-driven so that a click of a button is all that's needed to delete, search, or print a record. The best thing about *Mailbox,* however, is that it gives you the advantage of working with your records alphabetically while sacrificing little speed.

The program is well-prompted and requires little explanation. When you first use *Mailbox,* it automatically takes you to the subroutine for entering a record. Three windows appear in the screen. A tiny window displays the current record number; a large window lists a number of parameters – name, address, city, and so on, along with blank boxes for each; and the third window accepts input.

Whatever is entered in the input window will appear in one of the blanks, but with a few changes. Names, addresses, and cities entered entirely in lowercase will have the first letter of each word capitalized, and abbreviations for states and provinces are entirely capitalized. For instance, enter "new york, ny", and it will be converted to "New York, NY". Furthermore, Canadian postal codes are automatically capitalized; yla4c8 appears YlA4C8 (but it will be printed on a label as YlA 4C8). After typing in your record, you'll have a chance to make corrections before it's saved. Entering records with the same city and state is easy since the last entry is retained. If your last entry was "New York, NY", hit RETURN when prompted for the city and state of the next file, and "New York, NY" will be entered automatically.

The main menu offers five selections: ENTER, SEARCH, LIST, PRINT, and QUIT. Select ENTER if you wish to continue entering records. The program will not sort the first four records, but after all, records will be placed in alphabetical order. You'll be able to see this by choosing LIST from the main menu. This displays the first and last names of each file, along with the record number, in alphabetical order.

Of the main menu commands, SEARCH is the most comprehensive. With it you can find, change, delete, or print any file. When selected, SEARCH prompts you for the first name or record number. The fastest way to bring up a record is to enter its number. The subroutine here is flexible so you can enter both first and last names, or you can just type in part of a name. For instance, hit RETURN when prompted for the first name, enter "th" when prompted for the last name, and the first surname beginning with "Th" will be pulled down. From there, you can use PREVIOUS or NEXT to cycle alphabetically through the records. As each file is displayed, you can choose to CHANGE, DELETE, or PRINT it.

To print labels for several records, you'll want to use PRINT in the main menu. There you can select to print all the records from A to Z, or you can choose to select a range of files.

There are some program changes that you may wish to make. The program is set for 300 records, but you can adjust this by changing the variable "file" in the second line. You might also want to adjust the field length settings. If you find a field length too long or too short, just go to the data statements and change it. Of course, any changes in field lengths will make the program incompatible with previously saved files. ☐

Warning! See the note on page 66 regarding the utter folly of entering programs without first reading your Amiga BASIC manual!

```
DEFINT d-m,r,w-z:DEFSTR a-c,n,o,s,t
file=300:CHRn=CHR$(248):CHRd=CHR$(208)
OPTION BASE 1:DIM SHARED recno(file),s1(file),s2(file)
DIM SHARED typestat(7),fs(7),s(7),stat(7),box1(468),box2(930),watch(86)
SCREEN 1,640,200,3,2
WINDOW 2,"MailBox",(0,0)-(617,144),7,1
WINDOW 4,"Record # ",(550,133)-(617,141),2,1
WINDOW 3,,(0,158)-(617,186),7,1
  PALETTE 0,.6,.9,.9:PALETTE 1,0,.5,.5
  PALETTE 2,0,0,0:PALETTE 3,1,1,1
```

```
  PALETTE 4,1,.8,.7:PALETTE 5,.8,.8,1
  PALETTE 6,1,.8,.8:PALETTE 7,.9,0,0
LINE(32,5)-(108,18),7,b:PAINT(42,10),4,7:GET (32,5)-(108,18),box1:CLS
LINE(32,5)-(92,24),7,b:PAINT(42,10),4,7:GET (32,5)-(92,24),box2:CLS
CIRCLE (40,12),12,2:PAINT (40,12),3,2
LINE (40,12)-(39,9),2,b:LINE (40,12)-(45,12),2:GET (28,7)-(52,17),watch
setcity=CHRn:setprov=CHRn
FOR i=1 TO 5:READ title1(i):NEXT
FOR i=1 TO 6:READ title2(i):NEXT
FOR i=1 TO 4:READ title3(i):NEXT
FOR i=1 TO 7:READ typestat(i),fs(i):ln=ln+fs(i):NEXT
ON ERROR GOTO FalseStart
OPEN "Letters" AS 1 LEN=ln
FIELD 1,fs(1) AS s(1),fs(2) AS s(2),fs(3) AS s(3),
fs(4) AS s(4),fs(5) AS s(5),fs(6) AS s(6),fs(7) AS s(7)
ON ERROR GOTO 0
rend=LOF(1)/ln:IF LOF(1)=0 THEN GOSUB Enter
FOR i=1 TO rend:recno(i)=i:NEXT:CALL Sort
rend=rend+1:s2=CHRd
WHILE LEFT$(s2,1)=CHRd:rend=rend-1:GET 1,recno(rend):s2=s(2):WEND


Main:
WINDOW OUTPUT 2:COLOR 2,0:CLS
WINDOW OUTPUT 4:COLOR 7,6:CLS:PRINT TAB(4)USING"###";rend;
WINDOW OUTPUT 3:COLOR 2,5:CLS:COLOR 2,4
FOR f=1 TO 5:g=11*f-5:h=(g-2)*8:PUT (h,5),box2,PSET
  LOCATE 2,g:PRINT title1(f);:LOCATE 3,g+2:PRINT USING"_F#";f;
NEXT:a=""
WHILE (a<CHR$(129) OR a>CHR$(135)) AND MOUSE(0)>-1:a=INKEY$:WEND
IF a<>"" THEN ON ASC(a)-128 GOSUB Enter,Search,ListAll,Labels,Quit
ON INT((MOUSE(1)-40)/88)+1 GOSUB Enter,Search,ListAll,Labels

Quit:
MENU RESET:SCREEN CLOSE 1:END

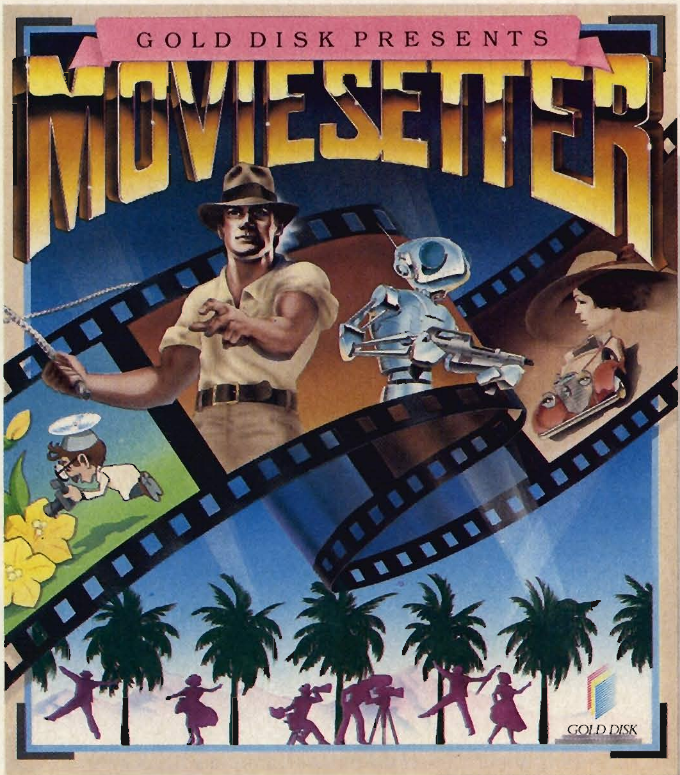
ReadRec:
GET 1,recno:FOR j=1 TO 7:stat(j)=s(j):NEXT:RETURN

WriteRec:
FOR j=1 TO 7:LSET s(j)=stat(j):NEXT:PUT 1,recno:RETURN

Enter:
rend=rend+1:IF recno(rend)=0 THEN recno(rend)=rend
recno=recno(rend):GOSUB ListStat
WINDOW OUTPUT 4:COLOR 2,6:PRINT TAB(4)USING"###";recno;
EnterRec 1:EnterRec 2:sf=stat(1):sl=stat(2)
IF stat(1)=CHRn AND stat(2)=CHRn THEN rend=rend-1:RETURN Main
FOR j=3 TO 7:EnterRec j:NEXT:GOSUB Change
GOSUB clock
IF rend=5 THEN CALL Sort
IF rend>5 THEN
  GET 1,recno(rend-1)
  IF s2>s(2) OR (s2=s(2) AND sl>s(1)) THEN RETURN Main
  Find sf,sl
  FOR j=rend TO i+1 STEP -1:recno(j)=recno(j-1):NEXT
  recno(i)=recno
END IF
RETURN Main

FindWhat:
WINDOW OUTPUT 3:COLOR 2,5:CLS:i=1
PRINT:INPUT" Enter First Name or Record #: ",sf
IF sf="" THEN sf="a"
f=ASC(UCASE$(LEFT$(sf,1)))-64
IF f<1 THEN
  j=VAL(sf)
  IF j>rend THEN i=rend ELSE i=1:WHILE recno(i)<>j:i=i+1:WEND
  RETURN
END IF
sf=UCASE$(LEFT$(sf,1))+RIGHT$(sf,LEN(sf)-1)
CLS:PRINT:INPUT" Enter Last Name: ",sl
IF sl="" THEN sl="a"
```

Saturday Matinee.



MovieSetter, the latest software blockbuster from Gold Disk, is the Amiga owner's ticket to pro-quality video animation and brilliant stereo soundtracks. And because of a software design breakthrough, it'll let you create dazzling overscan video movies that are minutes - not seconds - in length, without requiring truckloads of memory (512K minimum, 1MB recommended).

In spite of its power, MovieSetter is easy to use - even for the first-timer. Unlike other programs, it lets you see what you animate *as you animate it*. Using on-screen tools, it's easy to change speeds (up to 60 frames per second), colors (up to 32 on-screen at once), transition effects, and backgrounds. It's got handy built-in graphics and sound tools, and can import IFF graphic and sound files created by your favorite programs. Or you can take the shortcut and use the generous supply of "MovieClip" clip art and sound samples that are included with the MovieSetter program disk. Either way, "cutting together" your epic masterpiece will be a breeze with MovieSetter's full array of editing features - including the incomparable convenience of on-screen storyboards.

So bring a little tinseltown to your desktop. Call Gold Disk today at 1-800-387-8192 to order a copy of MovieSetter for only $99.95 (additional MovieClips sold for $34.95) or stop by your nearest Amiga software dealer.



Combine MovieClips, stereo sound, storyboards and...



history features to effortlessly create minutes of animation.

GOLD DISK

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Mississauga, Ontario, Canada, L5M 2C2
(416) 828-0913

This ad was produced using Gold Disk's Professional Page.

```
sl=UCASE$(LEFT$(sl,1))+RIGHT$(sl,LEN(sl)-1)
GET 1,recno(rend):IF sl>s(2) OR (sl=s(2) AND sf>=s(1)) THEN i=rend:RETURN
Find sf,sl:RETURN

SUB Find (sf,sl) STATIC
SHARED rend,i
sl=sl+SPACE$(fs(2)-LEN(sl)):sf=sf+SPACE$(fs(1)-LEN(sf))
f=ASC(LEFT$(sl,1))-64
GET 1,recno(1):IF sl<s(2) OR (sl=s(2) AND sf<s(1)) THEN i=1:EXIT SUB
i=INT(f/22*rend+1):WHILE i>rend-1:i=rend-1:WEND:GET 1,recno(i)
IF sl=s(2) THEN
  IF sf<s(1) THEN
    WHILE sl=s(2) AND sf<s(1):i=i-1:GET 1,recno(i):WEND
  ELSEIF sf>s(1) THEN
    WHILE sl=s(2) AND sf>s(1):i=i+1:GET 1,recno(i):WEND
  END IF
ELSEIF sl<s(2) THEN
  WHILE sl<s(2):i=i-1:GET 1,recno(i):WEND
  IF sl=s(2) AND sf<s(1) THEN
    WHILE sl=s(2) AND sf<s(1):i=i-1:GET 1,recno(i):WEND
  END IF
ELSE
  WHILE sl>s(2) AND i<>rend:i=i+1:GET 1,recno(i):WEND
  IF sl=s(2) AND sf>s(1) THEN
    WHILE sl=s(2) AND sf>s(1):i=i+1:GET 1,recno(i):WEND
  END IF
END IF
IF i<>rend AND ((sl>s(2) OR (sl=s(2)) AND sf>s(1))) THEN i=i+1
END SUB

ListRec:
WINDOW OUTPUT 4:COLOR 2,6:PRINT TAB(4)USING"###";recno(i);
WINDOW OUTPUT 2:COLOR 2,3:FOR j=1 TO 7:LOCATE 2*j,25:PRINT stat(j):NEXT
RETURN

ListStat:
WINDOW OUTPUT 4:COLOR 2,6:CLS:WINDOW OUTPUT 2:COLOR 2,0:CLS
FOR j=1 TO 7
  COLOR 2,0:LOCATE 2*j,7:PRINT typestat(j);
  COLOR 2,3:PRINT TAB(25)SPACE$(fs(j))
NEXT:RETURN

ListAll:
WINDOW OUTPUT 3:COLOR 2,5:CLS:COLOR 2,4
FOR f=1 TO 2:g=12*f-5:h=(g-2)*8:PUT (h,5),box1,PSET:NEXT
LOCATE 2,9:PRINT"NEXT"TAB(21)"EXIT
WINDOW OUTPUT 2:COLOR 2,0:CLS:h=0:i=-33
WHILE i<=rend AND h=0
  CLS:f=0:g=2:i=i+34
  FOR j=i TO i+33
    IF j<=rend THEN
      GET 1,recno(j):f=f+1:IF f=18 THEN f=1:g=39
      x=INSTR(s(2),"  ")-1:LOCATE f,g
      PRINT USING"###";recno(j);:PRINT TAB(g+6)s(2);
      LOCATE f,g+6+x:PRINT ", "s(1)
    END IF
  NEXT
  WHILE MOUSE(0)>-1:WEND
  CLS:h=INT((MOUSE(1)-40)/96)
WEND
RETURN Main

Search:
IF rend<5 THEN RETURN Main
GOSUB ListStat:GOSUB FindWhat:recno=recno(i)
GOSUB ReadRec:GOSUB ListRec
SearchMenu:
WINDOW OUTPUT 3:COLOR 2,5:CLS:COLOR 2,4
FOR f=1 TO 6:g=11*f-5:h=(g-2)*8
  PUT (h,5),box1,PSET:LOCATE 2,g:PRINT title2(f)
NEXT
SearchEnd:
WHILE MOUSE(0)>-1:WEND:e=INT((MOUSE(1)-40)/88)+1
```

Continued on page 78

TOPS IN AMIGA ENTERTAINMENT 1988

The Best New Games of the Year

By Arnie Katz and the Editors of *Ahoy!'s AmigaUser*

The bright promise of 1987 has become what may prove to be the dawn of a golden age of computer gaming for the Commodore Amiga.

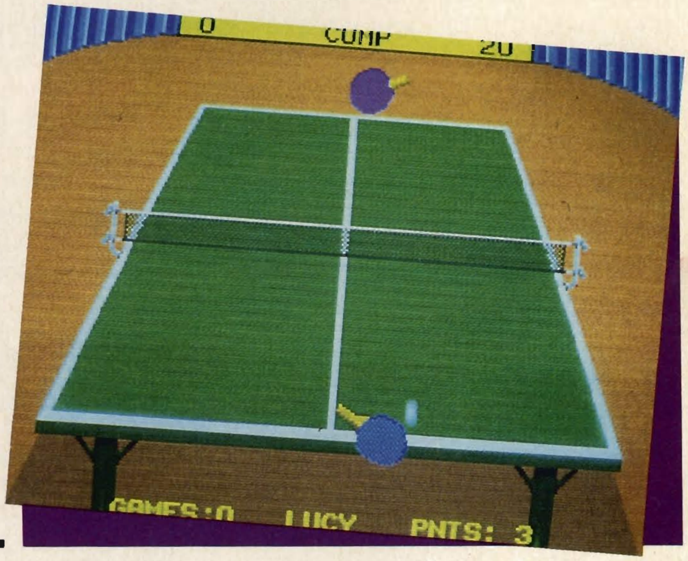
Last year, our panel of judges limited the "best of the year" survey to 13 outstanding titles. This year, it would be impossible to boil down the honor roll to such a small number.

Amiga entertainment software was still something of a curiosity in 1987, but now the Amiga is one of the machines on which many developers implement new programs. There are several reasons for this:

• The Amiga's sound and graphics are about the best of any home computer. Publishers consider the machine a showcase for their best new designs. Many like to launch a new title on the Amiga, because that version is likely to be the most impressive to the retailers and the media critics.

• Amiga ownership has increased steadily in the last 12 months. Now publishers can sell lots of copies of a hit game on the Amiga, instead of only a few thousand, as was the case in 1987.

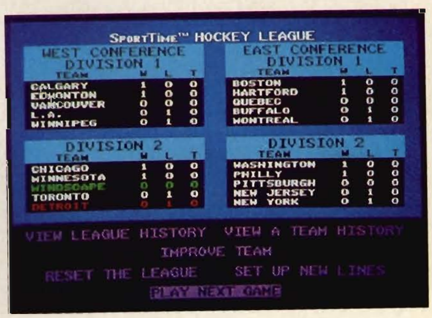
• The Amiga is winning its battle with the Atari ST for US market share. When they premiered, it looked like a toss-up. This spread product development evenly between them. While the ST audience has grown little in the last year, the Amiga has become a significant part of the home computer business. Games which might have been



Best of the Year: **Superstar Indoor Sports'** *combination of first-rate bowling, air hockey, ping pong, and darts simulations make it one of the all-time great software bargains.*



Defcon 5 *shows how a satellite-based defense system might actually operate.*



Superstar Ice Hockey: *coach or play.*

done first on the ST are now implemented on the Amiga first.

• The Amiga is now a force in international computing. The ST is popular in England and some other countries, but the Amiga is doing well just about everywhere. A game on the Amiga has a higher worldwide sales potential than one on the ST.

Ahoy!'s AmigaUser entertainment editors playtested more than a hundred games introduced for the Amiga between September 30, 1988 and October 1, 1987. The games described in this article are their choice of the best in a strong field. The judges could have added at least another 25 titles without sacrificing quality.

The writers who regularly cover entertainment software for *Ahoy!'s AmigaUser* have collaborated on this effort to salute the top Amiga entertainment products of 1988. The judging panel hopes that readers will understand that even doubling the size of the list would not include everyone's favorites. Apologies are also due to publishers whose programs arrived too late for consideration this year. They will be eligible for recognition in the "Best of 1989" competition.

Each category begins with our selection for the best new game of that type, followed by honorable mentions. It is only fitting that the first winner is *Ahoy!'s AmigaUser* outstanding game of 1988.

Game of the Year

As expected, this proved the hardest category to decide. There are so many games of approximately equal excellence that it almost seems unfair to single out one above the others.

For that reason, the editors and writers charged with making the selection looked beyond quality. The 1988 Game of the Year for the Amiga is a product which is not only outstanding in graphics, sound, concept, and play-action, but one which offers a tremendous value to the Amiga owner.

No one would have complained if Ed Ringler had marketed each of the four contests in *Superstar Indoor Sports* (Mindscape) as a separate disk. Putting all of them in one superlative package makes this title one of the all-time great software bargains.

Ping pong, bowling, darts, and air hockey aren't exactly glamor events, but Ringler's Designstar design group has implemented each of them in true major league fashion.

Sports

Superstar Ice Hockey (Mindscape), also by Ed Ringler and Designstar, is the consensus choice as the outstanding sports game of 1988. Considering this sport's intrinsically limited appeal, this program is a doubly impressive achievement. Anyone who likes the sport of hockey even a little can derive hours of enjoyment from this easy-to-play simulation.

SportTime has made the territory between the action contests and the statistically based simulations its own. *Superstar Ice Hockey,* like the other titles in this series, combines action and strategy in an irresistible mix. The gamer can coach from the sidelines and let the computer handle the action inside the rink, or take direct control of the team on the ice.

The best feature of *Superstar Ice Hockey* is the SportTime Hockey League. In the campaign mode, the computerist assumes the mantle of general manager and must build an expansion team into a powerhouse in seven rugged seasons.

Donald Hill lavishes the same meticulous attention to detail on *Ferrari: Formula One* (Electronic Arts) as he has on his celebrated flight simulators like *Fokker Tri-plane.* This is a true simulation of the professional sport of racing, not just a joystick-activated driving game. Hill's insight into the complexities of this sport earn a deserved honorable mention.

Action

Once upon a time, electronic gaming meant an Atari 2600 hooked to the family television set. *Breakout,* in which the player dismantled walls by blasting one brick at a time with a ball and paddle, was one of the most popular games of that era.

Blockbuster (Mindscape), the action game of the year, embellishes the basic elements of *Breakout* with new features that dramatically increase both the player's strategic options and the variety of play.

The main innovation is the system of power tokens. The player collects tokens for eliminating key bricks and can cash them in at any time for special abilities ranging from a larger paddle to a guided missile that blasts a whole row with one shot. If the gamer actually clears all the playfields supplied with *Blockbuster,* a construction module can create an endless series of additional ones.

Bubble Ghost (Accolade), designed by the French group Infogrames, is an action game in which finesse counts more heavily than reflexes. The player aims a friendly ghost's puffs of air to waft a bubble around obstacles like spikes and burning candles. Each playfield becomes progressively more difficult to complete in this subtle and charming "honorable mention."

German guards lurk around every corner in *Into the Eagle's Nest* (Mindscape). The player, as a World War II commando, storms the four-story fortress to liberate prisoners and steal the German war plans hidden there. Although the hero can absorb a lot of damage, he must take advantage of available cover and stalk each pocket of Nazi defenders carefully to beat the odds against finishing this multiphase mission.

Action Strategy

Computer game designers created the action-strategy contest to bridge the gap between games like chess and the more subtle arcade-style action contests. The best action-strategy titles force the competitor to plan rapidly as well as intelligently, simultaneously challenging the mind and the body.

Do you remember Larry, Moe, and Curly? Bob and Phyllis Jacob certainly did. They brought back the slapstick comedy team in all its irreverent glory in *The Three Stooges* (Cinemaware).

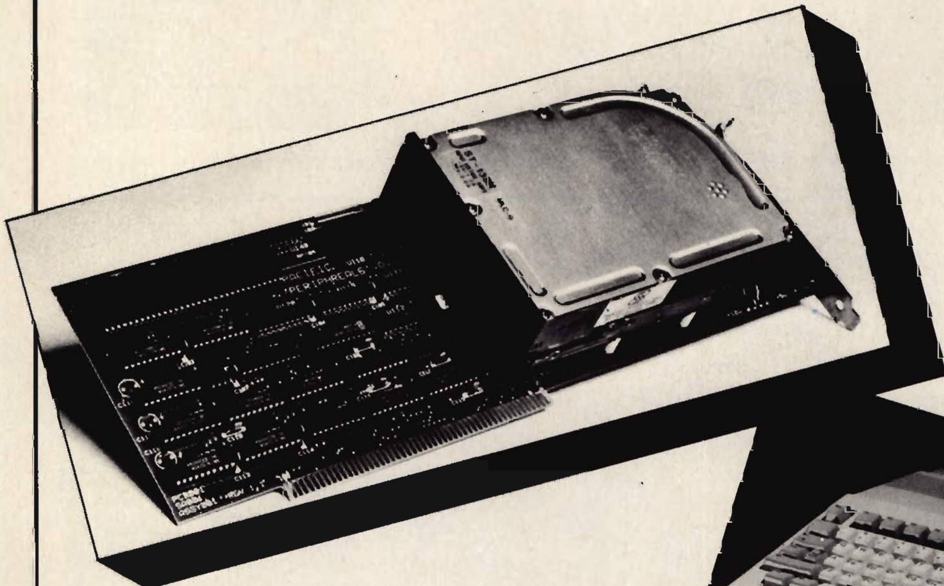
In this computerized boardgame, Larry, Moe, and Curly try to raise enough money to prevent the bank from foreclosing on Ma's Orphanage. Each of the odd jobs they take to earn money is a separate action game.

The most impressive thing about *The Three Stooges* is the way the art and animation communicate the boys' screwloose personalities. Few games even raise a smile, but some bits of business in *The Three Stooges* are genuinely worth a belly laugh.

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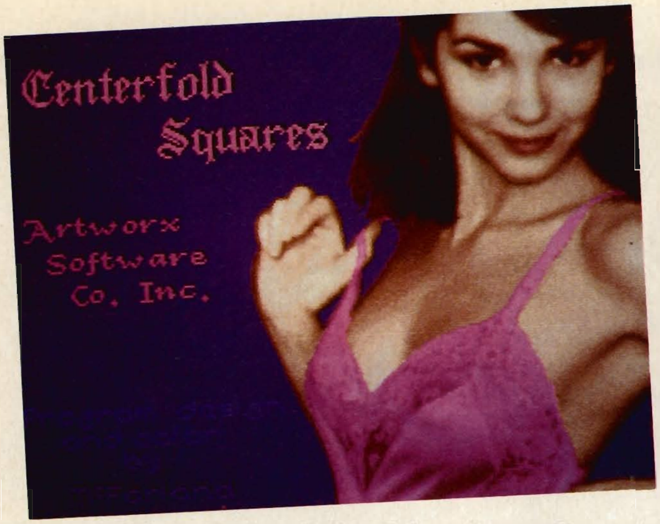
is a two-slot expansion chassis for the A500 that uses cards designed for the A2000.

An optional 3.5" floppy drive may be added as an "external" drive but is, in fact, more convenient than any drive available for the A500 (including the A500 internal drive). The 100-pin "Zorro II" A2000 expansion cards are less expensive, more uniform in design and more available than pure A500 peripherals. (For example, try to find a DMA controller designed specifically for the A500. How about an A500 Bridgecard?) Rather than take power from the A500 power supply, the SubSystem comes standard with a 54-watt power supply.

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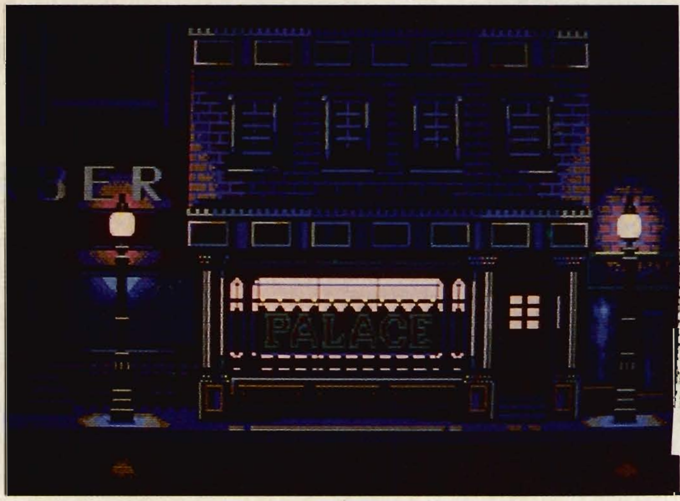
Centerfold Squares *is a lively adult variant on Reversi.*



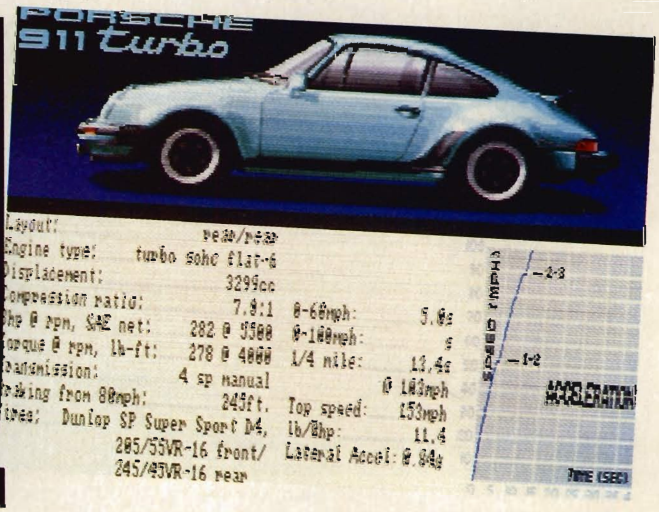
The Three Stooges *shows off the trio in vintage form.*

(SDI) system may never be deployed in the real world, but *Defcon 5* Cosmi) shows how this satellite-based defense shield might actually operate. Cosmi's "computer computer" interface builds a convincing illusion for the player that each move in the game really affects global security.

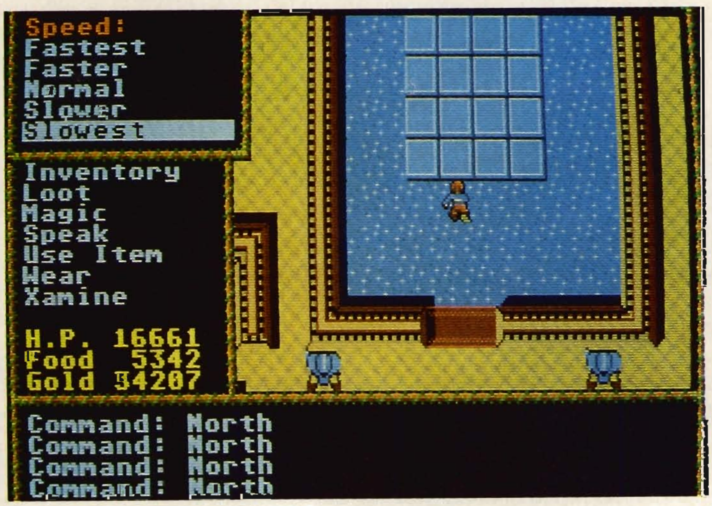
Another game which revives a classic concept with superior graphics and fresh play elements is *PowerStyx* (Digi-Tek). It updates *Qix,* the territorial acquisition game, with bonus objects and visually impressive reward screens for completing a level. Drawing boxes to



Shoot straight and walk crooked to become **King of Chicago.**



Test Drive *boasts accurately simulated race cars.*



The **Ultima-***derived play system of* **Questron II** *puts the available options right on the screen, allowing the gamer to concentrate on the quest, not the rules.*

fill the playfield looks easy, but the roving creatures which try to thwart the construction keep *PowerStyx* challen-



Jet: *multiple missions, perspectives.*

ging enough to entertain for many hours of play.

Roadwar (Arcadia) has the digitized sound and eye-popping animation of the coin-op original. Players compete head to head or against the computer to clear the highway of obstacles that include monsters and hostile spaceships.

Strategy

Just when computerists think they've seen the last word on a particular game subject, a designer pops up with an utterly novel approach to a supposedly tired topic. The odds against a chess program earning laurels as best Amiga strategy game of 1988 were astronomical. Yet when the smoke cleared, Brian Fargo's *Battle Chess* (Interplay) was the hands-down winner.

Chess is often called a metaphor for war, but *Battle Chess* is the first program that actually depicts the hand-to-hand fighting. When a piece captures another, a complex animated sequence shows how the winner routs the loser from the contested square. (See full-length review in this issue.)

Centerfold Squares (Artworx), a strategy game for adults, has the most beautiful nudes ever seen on a home computer screen. The graphics power of the Amiga produces genuinely erotic drawings in this lively variant on Reversi.

Q-Ball (Mindscape), by English Software, is also based on a popular pastime, billiards. Its 3-D, gravity-defying table could only exist in the electronic environment of the home computer. The keyboard controls set all the parameters for each shot and can even flip the whole table to show a different view of the situation. *Q-Ball* is far removed from standard pool, but Amiga owners will enjoy the difference.

Brodie Lockard, author of 1987's award-winning *Shanghai*, joined forces with Brad Fregger and Michael Sandige to create *Solitaire Royale* (Spectrum Holobyte). The program presents eight solitaire card games in an attractive, user-friendly package. The player can even peek under a pile of beautifully illustrated electronic pasteboards to see what might have been with a luckier deal.

Simulators

Flooring the gas pedal leads to a crash or a speeding ticket from the highway patrol in *Test Drive* (Accolade). The winding mountain course is tricky, but the accurately simulated race cars give skilled armchair drivers all the horsepower and maneuverability they need to get to the top.

Test Drive is the first driving simulator in which shifting truly plays a crucial role. The player constantly changes gears to safely corner hairpin turns and get top speed on the straightaways without blowing the engine.

Would-be pilots have an embarassment of riches in this year's honorable mentions. *F/A-18 Interceptor* (Electronic Arts) and *Jet* (SubLOGIC) are both outstanding flight simulators that have many fine qualities in common. They feature multiple perspective views, a wide range of missions, and outstanding color graphics in their depiction of jet flying.

Adventures

The Amiga has put the final nails in the coffin of all-text adventures. Users didn't buy this computer system so they could watch lines of plain copy crawl down the screen.

The outstanding adventure of 1988, *Rocket Ranger* (Cinemaware), combines strategy, roleplaying, exceptional audiovisual effects, and real-time action contests to immerse the player in a Saturday matinee serial about a hero in a flying suit. The art deco illustrations and delicate coloring create the ideal 1940s ambience for this quest to spike Hitler's plans for world conquest. (See full-length review in this issue.)

The crime films of James Cagney and Edward G. Robinson inspired *King of Chicago* (Cinemaware). The player must shoot straight but plan deviously to go from punk to crime boss in another triumph from the Bob Jacob hit factory. The conversation system, based on joystick-selectable thought balloons, gives the player plenty of opportunities to manipulate friends and foes on the way toward filling Capone's vacant chair.

Questron II (Strategic Simulations) is the sequel to one of the most popular joystick-driven adventures of the mid-1980s. The villain was vanquished in the first game in the series, but now the player must go into the past to destroy an evil magic book by preventing its creation. The play-system, derived from Lord British's *Ultima*, puts the available options right on the screen, allowing the gamer to concentrate on the quest instead of the rules.

Summing Up

It was a great year for Amiga entertainment software, but 1989 figures to be even better. Designers and programmers are only now beginning to tap its capabilities.

There will be at least twice as many new Amiga games in 1989 as there were last year. And gamers who think they've seen the ultimate in computer entertainment had better brace themselves for some revelation, because the best is definitely still to come. ☐

For further information on any of the games mentioned in this article, contact the companies listed below directly.

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Not even the Amiga can fit the names of the bonus squares in the little boxes on the Computer Scrabble *board, but they are color-coded.*

HOLE-IN-ONE
DigiTek
Amiga with 512K
Disk; $39.95

There are almost enough golf programs for the Amiga to run an electronic version of the PGA tour. The same is not true for golf's cute little cousin, miniature golf.

Thirty-six holes, plus a complete tutorial course, await one to four club wielding contestants in *Hole-in-One.* Each has a full complement of perilous pits, horrible hills, slippery slopes, bothersome barriers, and obnoxious obstacles. The program also makes provision for possible future course disks.

The holes are divided into two courses, Classic and Menagerie. The graphic treatment couldn't be more different if they were published by separate companies.

The Classic course presents the holes in overhead perspective. Color bands that shade from light to dark indicate pits, while dark to light shading signifies hills. Sand is yellow, and water hazards are blue.

A menu option causes contour views from any desired angle to appear on the screen. This helps line up difficult shots, but it is usually fairly easy to aim the next putt right on the green.

The holes of the Menagerie course are shown in two-thirds perspective. The illusion of depth gives designer Charles Carter and artist Scott Cribbs more latitude in the creation of the individual holes.

They've taken excellent advantage of this opportunity, too. The Menagerie course's 18 holes are full of surprises, including hidden cups and wildly distorted setups which are only possible inside a computer. Computerists can guess what to expect from the fact that the first hole is played upside down on the screen.

The play-mechanics for *Hole-in-One* are incredibly simple. Amigans who don't master the rules on the first hole can get step-by-step instruction from the online practice course, called "Golf School." This allows the divot digger to concentrate on strategy.

The player moves the ball to the tee with the mouse and presses the button to officially start the hole. A phantom ball, connected to the real one with a line, is used for lining up the ball and the cup. The longer the line, the more force behind the stroke. Clicking the left mouse button initiates the swing.

The pulldown menus allow the player to watch the previous shot again, to admire its beauty or figure out what went wrong. It is also possible, with the "retry" option, to erase the most recent shot and take a fresh try. Another choice on the same menu replaces the playfield with a scorecard.

A status bar at the top of the screen gives important information. The line shows the number of the hole, its par, the participant whose turn is underway, and a prompt to indicate the next required action.

Hole-in-One isn't quite as remarkable as the golf shot for which it is named, but it is at least a birdie and probably an eagle. This attractive, well-programmed disk is lighthearted and low key, perfect for a leisurely afternoon of gaming with friends or solitaire.

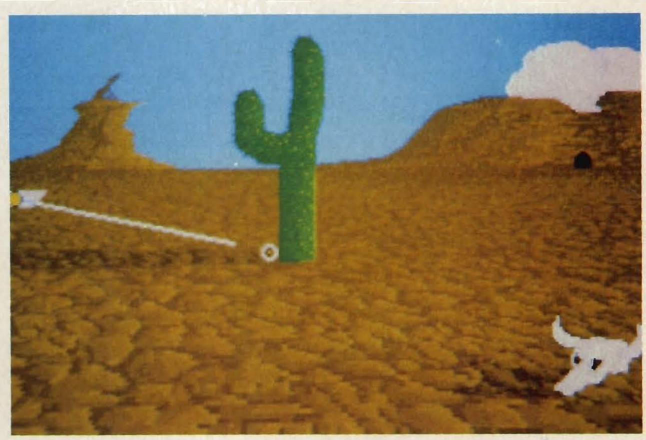
DigiTek, Inc., 10415 N. Florida Ave., Suite 410, Tampa, FL 33612 (phone: 813-933-8023). *–Arnie Katz*

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COMPUTER SCRABBLE
Leisure Genius
Amiga with 512K
Disk; $39.95

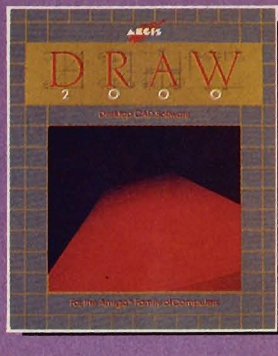
This British-based development house isn't the first to put the world's best-loved word board game onto a computer disk, but it is the first to do





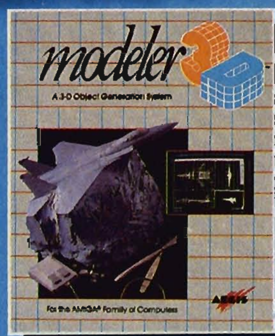
Each of Hole-in-One's *36 holes is full of perilous pits, horrible hills, slippery slopes, and bothersome barriers.*

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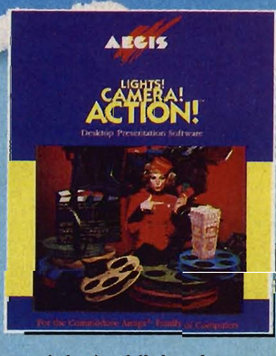
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the job right. *Computer Scrabble* allows up to four human word-hunters to play, and it can fill in admirably with as many computerized foes as you desire.

The routine of play follows the rules of the non-electronic board game to the letter. When prompted on the screen, each player forms words from the letters in the rack and places them on the board.

A combination of keyboard and mouse order entry accomplishes the task without undue difficulty. The player types the word and then points to the desired starting square with the mouse-controlled cursor. A series of pop-up windows allows the gamer to orient the word horizontally or vertically or even pick an entirely new word.

The right half of the screen shows each participant's score. It also monitors the thought processes of computer-directed opponents, if the user selects that option prior to the start of play.

The left side of the screen shows a regulation Scrabble board, in color. Even the Amiga can't put the names of the bonus squares inside those little boxes, but they are color coded. Also, an option on one of the pulldown menus tells players about extra-score spots.

The human participant sets the skill level of each of the robot players between "1" and "8." The computer averages a score of 200 in a two-player game at level "3."

The dictionary includes 23,000 words. Skill levels 1-4 access only a portion of the word list, while the higher settings can consult the whole thing.

Computer Scrabble includes a clock for those who want to set a time limit on moves. It can be set for as little as 30 seconds or as long as five minutes.

One limitation makes *Computer Scrabble* a lot better for solitaire sessions than multiplayer ones. During a player's turn, the rack is visible on the screen, directly below the board. Other human players must look away when not actually placing words to avoid seeing their rivals' stock of letters. That would be a lot of moving around in a three- or four-player game, though it is certainly workable for two.

There's no perfect way to handle challenges, but *Computer Scrabble* does allow a human to override its objection to a word. There is no way to challenge a computerized player's word.

The graphics are utilitarian, but attractive. The oversized letters look like tiles and are easy to read. This is especially important in multiplayer games, in which the participants generally sit further from the screen than in solo contests.

Computer Scrabble cannot really replace a group of strong players with a thick dictionary gathered around the board game version. But when live contestants are scarce, *Computer Scrabble* can give anyone's vocabulary a pleasurable workout.

Leisure Genius/Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404 (phone: 415-571-7171).

–Arnie Katz & Joyce Worley

Circle #256 on Reader Service Card



The rules for* Battle Chess *are the same as for any other edition. But when a capture occurs, the pieces face off in hand to hand combat for the square.

BATTLE CHESS

Interplay
Amiga with 512K
Disk; $49.95

Is this another chess program? Yes.





Rocket Ranger *is the computer equivalent of what the book business calls "a real page turner." Every screen of the strategy/action game has something worth seeing.*

Is this "just" another chess program? The answer is, emphatically, no.

Brian Fargo inaugurates his new Interplay label, an affiliate of Mediagenic, with a spectacular rendition of the classic strategy game. *Battle Chess* plays exactly like chess, but it looks and sounds like nothing computerists have ever seen.

Last year, many said that *Chessmaster 2000* (Software Toolworks) took computerized chess as far as it could go with present computer hardware. In a sense, that is true. *Chessmaster* has everything the regular player could want. *Battle Chess* plays as well, but it embellishes the basic structure with incredible sound and graphics. This program uses so much memory for audiovisual effects that owners of 512K systems must temporarily disconnect any external disk drives to have enough memory to run it!

It is important to emphasize that the rules of *Battle Chess* are the same as for any other edition of chess. The difference is the presentation. Each piece is strikingly drawn and fully animated. When there is a capture, the pieces face off in hand-to-hand battle for the square.

The fights are not interactive. The piece entitled to possession of the square under the rules of chess always sweeps the other from the board. The certainty of the outcome, however, does little to diminish the enjoyment of watching the pieces and pawns go through their paces.

Hint: Amaze your friends. Show them the Castle capturing the Queen. They'll thank you for it.

Todd J. Camasta and Bruce Schlickbernd, the artists, have given each piece its own characteristic movement style. The Queen's wiggily strut and the Knight's swagger are typical of the individuality each piece displays.

The three-dimensional chessboard works well with the solid-looking pieces. Those who find it hard to concentrate on strategy with all the distractions can switch to a conventional overhead view of the game.

Playing *Battle Chess* presents no problem for those familiar with chess. The computerist points the cursor at a piece and clicks the button. The square turns color, which cues the player to pick a destination square. Pointing and clicking at a square which the active piece can reach with a legal move causes the appropriate animated move to play on the screen.

The documentation is primarily for novices. Most of it is devoted to a short course in the fundamentals, including how to move each piece.

Another section lists the moves of 20 great games of the past. These matches are instructive, but they also serve as the basis for the program's copy protection. Before play begins, the computerist must enter the correct move in response to the message in a pop-up window.

Battle Chess has all the features you'd expect in a great computer chess program, plus one that is pretty rare. *Battle Chess* can be played between two computerists through modems. If there are no human opponents available at all, the computer plays at any of nine skill levels.

Battle Chess seems ideal for those who play occasionally and want a livelier, more visual game experience. It may be a little wild for the grand masters, but Interplay has given the rest of us a delightful treat.

Interplay Productions, 1575 Corporate Drive, Costa Mesa, CA 92626 (phone: 714-549-2241). *–Arnie Katz*

ROCKET RANGER

Cinemaware
Amiga with 512K
Disk; $49.95

Republic Pictures made several movies about the adventures of men in personal flying suits. Commander Cody is probably the best-known, if not the first, of these flying heroes.

Now Kellyn Beck's *Rocket Ranger* has revived the genre. Cinemaware's finest art, animation, and sound create an interactive movie in which the adventure has two main elements, a strategic game and the action modules. The former is conducted with onscreen menus, while the latter is activated with the joystick.

The long-term goal is to prevent the Nazis from winning World War II. The Rocket Ranger must assemble pieces of a rocket, find enough Lunarium fuel, and zoom to the moon to defeat the fascists in space.

The Rocket Ranger can fly from country to country in his flying suit to find pieces of the rocket and supplies of Lunarium. Since the suit also runs on Lunarium, wise players use the field agents under the Rocket Ranger's command to do most of the searching.

The action games convey the experience of being the Rocket Ranger. As in previous Cinemaware programs, the individual games are not overwhelmingly difficult.

This is both good and bad. Players won't get stuck in one impossible game that prevents them from getting to the rest of the story. On the other hand, *Rocket Ranger's* arcade contests, beautiful as they are, don't have as much replayability as more challenging ones.

And make no mistake, this is one beautiful game. Art Director Rob Landeros' art deco style with hints of sepiatone is perfect for a game set in 1940.

Rocket Ranger is the computer equivalent of what the book business calls "a real page-turner." Every screen has something worth seeing, and the animated sections, both interactive and non-interactive, evoke memories of those wonderful Saturday matinee serials. No game comes closer to fulfilling Cinemaware's ideal of producing interactive movies.

The Secret Decoder Wheel is more than a delightful extra. Cinemaware has adapted the idea, so appropriate for a game like *Rocket Ranger,* to function as the copy protection. The colors of the Secret Decoder Wheel prevent copying, and the computerist can't use the flying suit without it.

The rim of the wheel shows current locations, and the window lists possible destinations. The number shown in the window next to the destination indicates the number of units of Lunarium required to make the trip.

The player must put that exact amount in the suit, or the Rocket Ranger either crashes or lands in the wrong region. Actually, the crash scene is so well done that you'll want to make a mistake on purpose at least once. The flip side of the decoder has a world map with the regions clearly marked for those uncertain of their geography.

Cinemaware always strives to make their games accessible to a broad spectrum of computer owners, but *Rocket Ranger* is not quite as easy to learn as the designers believe. The documentation encourages people to boot the disk and get into a game, but there are as-

pects of play which the onscreen instructions do not illuminate. Reading the rules first, which takes about five minutes, can prevent later frustration and is definitely recommended.

Rocket Ranger is an absorbing, involving game. The goals sound so easy, but actually stopping Hitler's war machine is a more complex procedure than it may seem at first. The player must manage the secret agents well, conserve the limited supplies of Lunarium, and demonstrate some expertise in the action games to stand a chance against the Nazi horde.

It's easy to quibble with the details of any game, especially one as detailed as *Rocket Ranger.* No program is so good that it can't be improved in a dozen ways. Yet it's the sum of the parts that concerns the gamer. And *Rocket Ranger* adds up to a fascinating and highly entertaining action-adventure no Amigan should miss.

Cinemaware, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362 (phone: 805-495-6551).

—Joyce Worley & Bill Kunkel

AWESOME ARCADE ACTION PACK: VOLUME 1

Arcadia (dist. by Electronic Arts)
Amiga with 512K
3 Disks; $49.99

The practice of using Amiga-derived technology for coin-op machines is now paying off for home computerists. This bundle of three arcade action contests bolsters any library of boot-and-bash Amiga titles at the reasonable per-game price of about $15.

Sidewinder, a top-down scrolling shootout, features nothing but quick movement, constant firing, and lots of impressive explosions. The player shoots and dodges at any of five skill levels from "Beginner" to "Master."

The premise of *Sidewinder* echoes elements of "Star Wars." The game begins at a pivotal moment in an interstellar war. The aliens have sent the gigantic Star Killer to our solar system to destroy the life-giving sun. When Earth's battle fleet fails to make a dent in this lethal leviathan, the planet's last hope is that a single-seat fighter can infiltrate the defenses and blast the heavily defended control center before the Star Killer can complete its deadly work.

The computerist starts this quest against overwhelming odds with four lives. The game awards the first extra ship at 50,000 points and adds another every 100,000 points.

The player can collect four types of power packs in the Star Killer. Each endows the tiny craft with a potent special ability for about 15 seconds. Depending on which pack is activated, the player can fire continuously, become invulnerable to enemy attack, hover, or increase the potency of each salvo from the dual nose-mounted guns.

Blastball pretends to be an exacting simulation of a fast-paced sport which has captured fan attention in the 37th Century. This intriguing premise is the basis for a game with the kinetic fury of an arcade shoot-em-up, but the strategy of an athletic contest.

The player pilots any of 10 different ships in a one-on-one showdown against an identical ship controlled either by a second player or the computer. The ships try to nose or blast the ball across the goal line for one point or into the goal area for two. The game automatically ends after three minutes, though the action stops immediately if either side accumulates nine points.

The abilities of the ships selected for play shape each game of *Blastball.* Some go very fast, but slip and slide on the playfield as though it were a sheet of ice. The slower ones are easier to control, but don't accelerate well. Similarly, most classes of ships have non-homing missiles, but using the ones which do makes the action even fiercer.

War has come to the civilized galaxy after 500 years of peace in *Xenon,* the third component of this arcade trilogy. The hero of this blast brigader's delight, Darrian, is described as a recently commissioned officer. He gets more practical experience than he expected when a distress call interrupts his routine fighter patrol.

Darrian must fight through four sections, each divided into four zones. It should come as no surprise to action combat game fans that land- and air-based aliens assault his craft every inch of the way.

Fortunately, the lone hero's scout ship is far from defenseless. It can, at will, switch between a ground vehicle capable of four-way movement and a faster jet fighter. Knowing when to use the tank and when to employ the plane is the key to survival.

Power pills, which sometimes appear after the player destroys certain portions of the Xenite defense, boost the craft's powers still further. The bonuses range from lasers to balls which follow the ship and mimic its firing pattern. Some power pills, like "gun," actually cancel stronger weapons. The wise player determines the nature of the power pill before swooping down to claim it.

Xenon, for one or two players, is a pleasing blend of intense action and combat strategy. The ability to change the ship's form distinguishes it from games which offer nothing beyond fire and movement.

The contests in *The Awesome Arcade Action Pack* aren't the last word in originality, but each is a thoroughly enjoyable and highly replayable game. Arcadia's latest looks like a smart investment for any Amiga arcade ace.

Arcadia (Electronic Arts), 1820 Gateway Dr., San Mateo, CA 94404 (phone: 415-571-7171). *—Arnie Katz*

MS-DOS MEETS AMIGADOS

A〉 Part II: MS-DOS Primer & Beyond A

By Ted Salamone

Welcome to the second installment covering MS-DOS in the Amiga environment. Before we discuss procedures and experiences I want to touch on changes to the hardware used for this article, recent Commodore announcements, and provide a primer on MS-DOS.

First, the Amiga for this series now has a 20 meg IBM formatted hard card (FileCard brand) installed in addition to the 20 meg Amiga hard drive, 360K MS-DOS floppy, and 880K Amiga floppy drive. I've also added the Master 3A, an external 880K floppy from Surfside Components International.

Second, Commodore has announced the upcoming release of an Intel 80286 based Bridgeboard, a card which will add IBM PC AT class power and speed to world of MS-DOS Amiga style. This advanced coprocessor also sports a slot for one of the higher end Intel math chips in the 80287 series. (The current Bridgeboard runs on an Intel 8088 chip and supports the Intel 8087 math chip.)

I am mentioning this for two reasons. One, do not delay purchasing the current Bridgeboard because the new one is "right around the corner." Besides an undoubtedly steeper price (the actual price of the 286 board wasn't set when this was written), and an uncertain release date, most users will not need the extra capability.

Second, the release of the 286 board will not render the A2088 obsolete. Each board serves its own market. Despite general advertising hype that new is better, computer equipment is not obsolete if it still gets the job done.

MS-DOS PRIMER

MS-DOS is similar to the Amiga's CLI in concept, and somewhat less so in execution. In the IBM world commands are entered after the drive prompt (A> or C> for example), while CLI's are numbered starting at 1. Since IBM machines running MS-DOS are not multitasking, however, only one command can be issued at a time. (Only one drive can be accessed at a time, making it impossible to issue more than one command simultaneously.) Compare this to the Amiga's multitasking CPU in which the number of CLIs (and therefore number of commands) which can be opened (issued) simultaneously is limited to the amount of RAM installed and the size of the task invoked by each CLI window.

MS-DOS commands can be broken into two categories, internal and external. Internal commands reside in RAM after the operating system loads. They execute immediately when entered, and are not visible when you issue a directory command to view available files and commands.

The most commonly used internal commands are BUFFERS, CHDIR, CLS, COPY, DATE, DEL, DEVICE, DIR, FILES, MKDIR, PATH, RMDIR, TIME, and VERIFY. (See chart on page 42.)

The most commonly used external commands are ANSI, SYS, CHKDSK, DISKCOMP, DISKCOPY, FORMAT, and PRINT. (See chart on page 44.)

OTHER BASICS

Besides the commands, there are a few other preliminaries you should know about MS-DOS.

The directory/subdirectory structure branches out like a tree, in the same fashion as the Amiga. By specifying pathnames you can navigate through the structure. For example, CD/MAP/SAMPLES/EUROPE would place you in the EUROPE subdirectory from any other directory on the same disk.

Batch files can be created with MS-DOS. By typing the name of the file, or entering it into another batch file, you can execute the commands included. The AUTOEXEC.BAT file is a special example of such a file because it loads and is executed at system startup. By adding various commands or other batch files to it, you can customize your system. If you always use a specific spreadsheet, for example, you could direct the AUTOEXEC.BAT file to load a mouse driver, change the screen, display the parameters, and start the program.

By now CLI users will notice some of the similarities previously alluded to. Workbench-only Amigaphiles will have to learn the intricacies of MS-DOS' command line interface because there is no graphic shell or pulldown menu interface. Though it may seem arcane at first, and it is, don't be intimidated. MS-DOS can work for you; you'll have a feeling of accomplishment once it's mastered.

AMIGA SPECIFICS

When running MS-DOS under AmigaDOS, the Amiga

provides a set of pulldown menu choices activated by the Amiga mouse. Some MS-DOS programs use a mouse, but more often than not these programs will not be able to use the Amiga mouse. You have to install an IBM compatible mouse, by inserting an IBM compatible async (serial) card into an IBM slot and attaching the mouse. Adding a serial port of this type is also the way to operate a serial printer, modem, or serial plotter.

Back to the menu choices. There are three headings, the first of which is called Project. This heading has four options: SAVE SETTINGS, RESTORE SETTINGS, INFO, and CLOSE.

SAVE SETTINGS is a way to store your preferred colors as set in the COLOR option under the Display heading. If you've made unsatisfactory changes to the display, RESTORE SETTINGS is the simple way to invoke the default settings, or those that were in force when you booted the system. INFO opens a window displaying bare bones help on how to use the Bridgeboard's features and commands, while CLOSE duplicates the terminating activity of the close window gadget in the upper left hand corner of any AmigaDOS window.

MOST COMMON INTERNAL MS-DOS COMMANDS

BUFFERS
Sets the number of disk buffers allocated to memory. This determines the number of holding buffers used during read/write operations. Setting an average system to anywhere between 10 and 20 buffers will increase its efficiency because the system will check its buffers before reading or writing data. If it is already in a buffer, then it doesn't have to be accessed, thereby eliminating a time consuming disk access.

CHDIR (or CD)
Allows you to display or change the current directory or subdirectory. Typing CHDIR lists the contents of the current directory; typing CHDIR/DOS would change the current directory to the one titled DOS.

CLS
Clears the screen, leaving only the DOS prompt in the upper left hand corner of the screen.

COPY
Copies files to the same or another disk. It also transfers data between devices. There are optional switches which can be set to modify the command's execution. For instance, COPY a:ted.doc MM ted.doc /V would copy the file called ted.doc to the current directory from the same file residing on the disk in drive A and automatically verify that the contents of the file in the new directory match the contents of the original file.

DATE
Used to set and display the date.

DEL (DELETE)
Removes the named file from the specified disk.

DEVICE
Directs the operating system to load an additional file which contains a special device driver. This would be entered into the CONFIG.SYS file, a special file which is read by the AUTOEXEC.BAT file. The AUTOEXEC.BAT file is loaded immediately after the internal commands, directing the CPU to do tasks according to the instructions in the file. For instance, DEVICE = JDISK in the CONFIG.SYS file (accessed by the AUTOEXEC.BAT file) would automatically make the system add that special driver to its repertoire. (See the end of this article for more on JDISKS.)

DIR (DIRECTORY)
Lists the files in the current directory. Switches are also available here; the command DIR /P would cause the scrolling list to pause at each page full of information while DIR /W would cause the directory to be displayed across the full 80 column width of a typical monitor.

FILES
Specifies the number of files that can be opened at the same time. This is not the same as multitasking! From 1 to 99 can be opened. FILES = 15 would be added to the CONFIG.SYS file to automatically set the system (if an AUTOEXEC.BAT file is present). Without this command, or with one set too low, the system may not be able to operate correctly and will return an insufficient files error.

MKDIR (or MD) (MAKE DIRECTORY)
Creates a new directory or subdirectory. MD /MAP would create a directory entitled MAP.

PATH
Allows the system to locate and execute command and batch files (those with a .BAT extension) not in the current directory. It's most often used in an AUTOEXEC.BAT file.

RMDIR (or RD) (REMOVE DIRECTORY)
Erases a previously created directory. The directory to be eliminated must not contain any user-created files, or the command will not work. (See the DEL command under external commands for more information.) RMDIR /MAP would erase the MAP directory.

TIME
Sets and displays the time. Both DATE and TIME can read a battery operated clock and automatically display the appropriate data. It's often inserted into the AUTOEXEC.BAT file.

VERIFY
Performs the same task as the /V switch and the COPY command. By issuing VERIFY, all copied files will be verified. Issue the command again to turn the function off.

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The Edit heading contains two commands, CUT and PASTE. This is the clipboard control center, a text storage buffer the same as the Notepad on the Amiga side of the computing universe. With this facility you can cut and paste text between the Amiga and the MS-DOS sides, as well as within the MS-DOS frame of reference.

After selecting COPY just press the left mouse button and sweep over the desired text. This text highlights; releasing the button cuts the text and places it into clipboard.

MOST COMMON EXTERNAL MS-DOS COMMANDS

ANSI.SYS
The extended screen and keyboard device driver. It allows implementation of extended cursor control commands and screen display options. Usually added to the CONFIG.SYS file as DEVICE = ANSIS.SYS, it's used by numerous commercial software packages.

CHKDSK (CHECK DISK)
Scans the directories on a diskette or a hard drive, checking them for inconsistencies. Essentially it verifies the directory structure. Using the /F switch causes some of the problems to be repaired after the CHKDSK command reports them.

DISKCOMP (DISK COMPARE)
Matches the contents of one disk against the contents of another. It is useful for verifying copies that were made with a /V switch or under control of the VERIFY command.

DISKCOPY
Copies the entire contents of one disk to another. It automatically formats an unformatted target disk in the process. This is a faster method than using COPY.

FORMAT
Prepares a floppy disk for use by MS-DOS. It can also be used to set up a hard drive. There are numerous switch settings possible; some alter the formatted structure of the disk, others add system files to the disk–making a self booting disk in the process.

PRINT
Directs a specified file to a printer for hardcopy output. Switches include /P to turn print mode on, /C to cancel print mode, and /T to delete all files waiting to be or currently being printed.

The other side of the operation is handled by the PASTE command. Once text is in the clipboard, select PASTE and the text is dropped in at the current cursor position. Pasting can also be done by double clicking on the right mouse button or by pressing the right Amiga key and the "." key simultaneously.

Because the third heading (Display) contains so many commands, we'll cover that in the next installment. Right now we'll discuss the Bridgeboard's virtual disk capability.

JDISK EQUALS VIRTUAL DISK

To begin, a virtual disk is nothing more than a special storage area. It performs like a standard MS-DOS floppy drive, but the contents, including directories and subdirectories, are stored as one contiguous file on any Amiga disk drive.

By entering a few commands you can create an MS-DOS storage area tied to the Amiga's RAM, hard drive, or any floppy drive. This is more than reading/writing files between the operating systems and less than partitioning a hard drive so it contains MS- and AmigaDOS sections.

The actual procedure is quite simple. Working with a copy, create, or add to, the CONFIG.SYS file on the MS-DOS disk. Create the file by typing "COPY con CONFIG. SYS" without the quote marks. Press ENTER (RETURN). Type "DEVICE =JDISK.SYS" and press ENTER. (Not related to this function, but useful in its own right, is the following sequence: type "BUFFERS=15", press ENTER, and type "FILES=15" and press ENTER. (Remember, do not type the quote marks.)

Once done, press function key F6 and press ENTER. The system will write the newly created CONFIG.SYS file to the floppy. If you don't have room on the disk, remove the SET and/or SHELL commands and try again.

You may add the virtual disk command to an existing CONFIG.SYS file by typing "EDLIN CONFIG.SYS" after the DOS prompt (most likely A>) and pressing ENTER. Type the letter "I" and press ENTER. Then type "DEVICE=JDISK.SYS" and press ENTER. Press F6, and press ENTER. The new CONFIG.SYS file will be written to the disk.

We need to discuss a few more items before issuing the virtual disk commands. Make certain the JDISK.SYS and JLINK.COM files are on the same MS-DOS system disk as the CONFIG.SYS file and that the PC Disk file (in the Amiga PC directory) is running. For the CONFIG.SYS file to be effective you must reboot the system, either the Amiga via CTRL-A-A or the MS-DOS side only by simultaneously pressing CTRL-ALT-DEL. Either of these actions will force MS-DOS to read and act upon the CONFIG.SYS file at startup, a necessary event. Rebooting won't be necessary again, unless you alter the CONFIG.SYS file.

Now for the UDISKs. From the MS-DOS prompt type "JLINK e: ram:vd/c:1000" and press ENTER to create a 1000 kilobyte drive E> in the Amiga's RAM drive. Now type "JLINK" and press ENTER. You will get a readout of all possible virtual drives and any ones already set. For E: you will see R/W under the Status column and VD under the Linked to column. This is saying that a Read/Write virtual disk called E: has been created in the Amiga RAM drive.

By including different switches with the JDISK command you can create Read Only drives, suppress error messages, or unlink the drive (so the Amiga can once again access that space).

Virtual disks are helpful when dealing with large amounts of data or when speed is essential. In the first case you would set up a drive on the Amiga hard drive for large capacity jobs; in the latter case you would create a RAM drive for near-instantaneous access.

Until next time... □

FLOTSAM

Send your comments on any aspect of Amiga computing to *Flotsam*, c/o *Ahoy!'s AmigaUser*, Ion International Inc., 45 West 34th Street—Suite 500, New York, NY 10001.

I realize that you do not yet have an *S.O.S.* column similar to that in the original *Ahoy!* magazine. I hope that will be rectified soon, as I am sure that many readers would benefit from the expertise of *Ahoy!'s AmigaUser's* contributing editors.

At any rate, I have a question which I hope that someone at the magazine may be able to answer.

Before I bought my Amiga 500, like many others, I owned a Commodore 64. Although the Commodore BASIC language did not permit it, I found two very useful programs which would allow me to use calculated GOTO's, i.e., GOTO or GOSUB a variable—such as 'x=line : GOTO x'. In some cases, this capacity made programs much more efficient. On the Commodore 64, this was accomplished by transferring the 64 ROM into RAM, and then manipulating it by POKEs to accomplish the desired effect. As this capability is also not available (I believe) in Amiga BASIC, and would be equally beneficial on the Amiga, my question is:

Is there any way that Amiga BASIC can be manipulated to allow GOTO or GOSUB statements to be directed to a variable, rather than being directed only to a label or a line number?

If you could provide one, I am sure that many BASIC programmers would be very grateful.

Good luck with *Ahoy!'s AmigaUser*. We need it.

—Robert Bromley
Malton, ONT

Unfortunately, Amiga BASIC cannot be as easily modified to allow calculated GOTOs and GOSUBs as the C-64 or C-128. To modify Amiga BASIC to perform such a task would require a routine written in C or 68000 assembly language to patch into the Amiga BASIC interpreter, such a function. Such a routine might be readily available on the Fred Fish or Amicus series of public domain disks.

If you do find such a routine, make sure that you make a backup copy of the Amiga BASIC disk before you run the patch. Sometimes these routines found in public domain don't work, or will only work with a certain version of the interpreter. You might wind up trashing Amiga BASIC instead of enhancing it.

If this sounds distasteful, an alternative might be finding an Amiga BASIC compiler that will allow such an expression in GOTOs and GOSUBs, and will generate the necessary code for the program to work properly. This is probably the safer and easier of the two alternatives; however, it will cost you much more money.

Either way, you are in for challenge. Remember that Amiga BASIC was designed so that line numbers did not need to be used. The designers at Microsoft probably thought that adding a calculated GOTO/GOSUB function was self-defeating.

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In spite of all the fabulous painting and drawing programs placed at our disposal by the Amiga, many of us have found one thing yet to be lacking: a talent for using the tools.

Fortunately, this has been recognized by a company called Magnetic Images—who have probably also realized that some people who do have the proper talent do not have either the time or the tools to create drawings for use in newsletters, personal notes, and the like. The result is a series of data disks called *Clip Art!*, each disk filled with a profusion of images that should fit the needs of anyone. Well, almost anyone.

Having seen only volumes 7 and 8, I should hedge my comments on content, but I'm afraid *Clip Art!* may be shaping up like the drawing libraries included with desktop publishing programs and with integrated word processors: there is a serious lack of raccoons. We can only hope that this situation either does not prevail in previous volumes, or at least will be remedied in future volumes.

It could be simply that the producers had other fish to fry. Certainly there are plenty of fish on Volume 7, as well as other forms of sea life. There are also two directories filled with pictures designed to evoke memories of simpler times: biplanes, hand-cranked telephones, tin lizzies, pot-bellied stoves, and the like.

Two other directories contain pictures associated with gambling, another continues with nautical objects, and two others contain scenes associated with tales of knighthood. While we doubt many newsletters will be printing the standings from the lists or offering tips on how to improve your jousting, it does not hurt to be prepared.

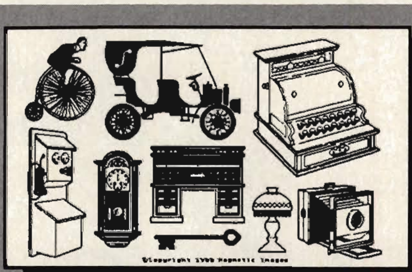
Volume 8 contains nine directories, and the theme of Christmas runs throughout the disk. Included here are enough illustrations to outline the story of the first Christmas or to illuminate "A Visit From St. Nick."

But still no raccoons.

All pieces of clip art are line drawings in black on white. There are two reasons for this. The first is that these were primarily designed to be used in desktop publishing with programs such as PageSetter, City Desk, and Publisher Plus. The second is that this method of delivering images permits high resolution with any program with which they may be used.

The images are all in IFF format, allowing them to be used in a variety of programs, and they are stored with a ".bru" suffix. As brushes, they are subject to being resized and cropped when used with publishing programs that permit such manipulations.

Images from *Clip Art!* can be used with *City Desk, PageSetter, Professional Page, Shakespeare, ProWrite, Publisher Plus, TextPro,* and others. I was able to verify that it worked well with the last three named. I also tried it with *VizaWrite* and, while it works, the images are reversed—white on black. However, since *VizaWrite* text also appears as white on black, it should work.







A somewhat hidden benefit may lie in loading the *Clip Art!* images into a program such as *Deluxe Paint II*. (Not entirely hidden: the readme document on the *Clip Art!* disk suggests doing this if you want to alter or customize a particular image.) In our experimenting, we found that images loaded into *DPII* are again reversed, but this did not prevent our being able to add color, chiefly through use of the "fill" feature, and so expand the uses to produce full color images that can be used with *Shakespeare* and, perhaps, with *Excellence!* Alternatively, they can be printed as stand-alone art, just as you'd do with anything else created with your painting program.

Almost no documentation is included with *Clip Art!* Apparently the producers expect that anyone who knows how to operate a desktop publishing program will know how to load a graphic, and they are probably right. There is the "read.me" document which you can see by calling it up into Notepad, but it offers little other than to tell you the pictures are IFF and are not public domain. This document does offer the observation that combined pictures and text are best created when the text is added within the publishing program. Adding text with *Deluxe Paint* or some other painting program may not provide the highest resolution.

To make up for the lack of documents, there is something unique in the method of packaging. On the back of each package are reproductions of the nine directories on the disk, showing all the cuts contained in each directory. Few programs can utilize packaging to show you absolutely everything you are

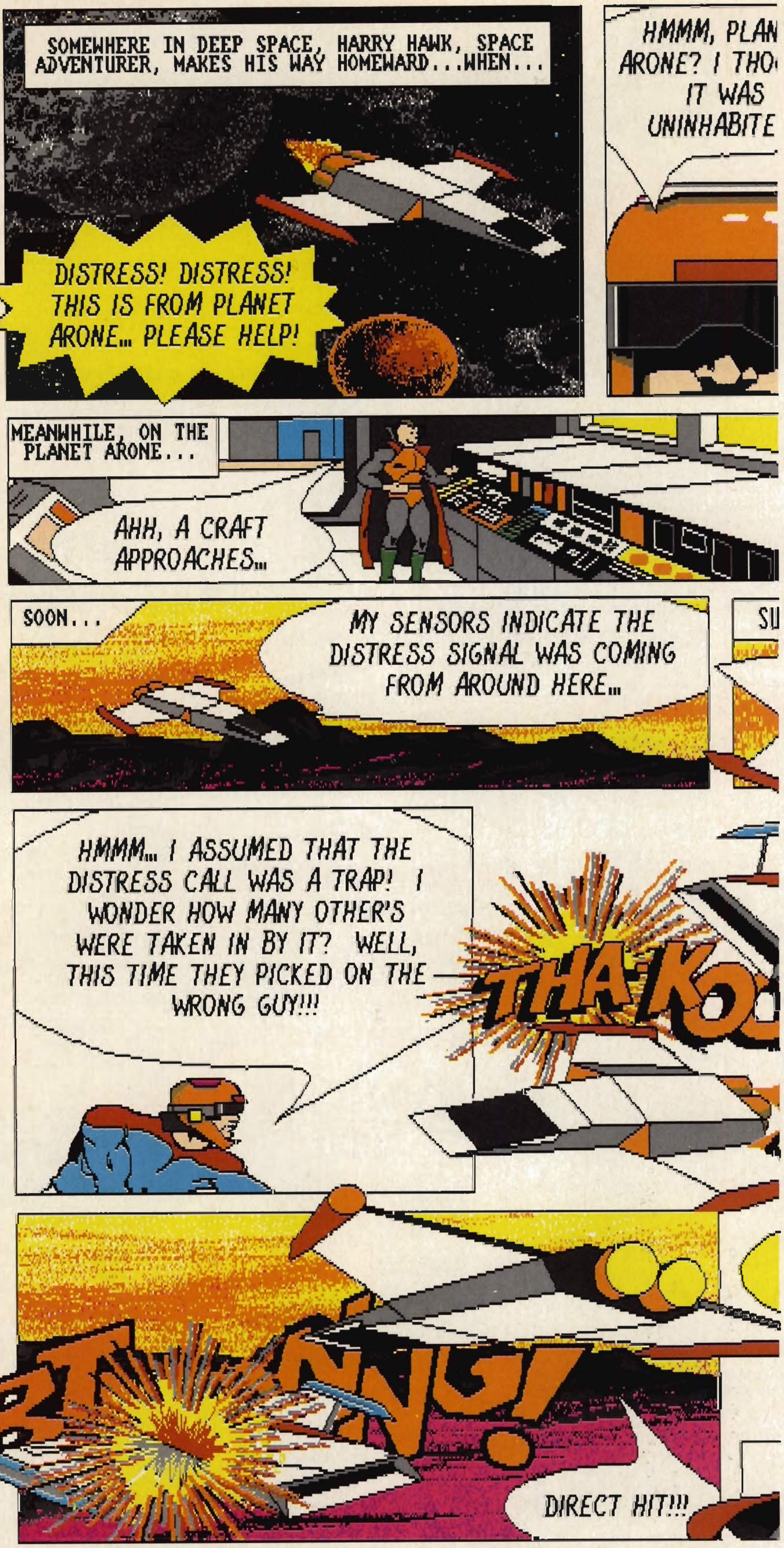
going to get, and it is to the credit of Magnetic Images that they thought to use their package in this way.

Of course, it is a two-edged sword, allowing you to pass on purchasing volumes that may not contain graphics of use to you: as an example, it will tell you immediately which volumes do not contain raccoons.

If your needs are simpler than mine – if you do not require raccoons – *Clip Art!* can be a valuable addition to your library of images.

Magnetic Images Co., P.O. Box 17422, Phoenix, AZ 85011 (phone: 602-265-7849). *–Ervin Bobo*

Circle #108 on Reader Service Card



You provide the imagination – Comic Setter *supplies the heroes, balloons, etc.*

COMIC SETTER

Gold Disk
Amiga with 1 megabyte
Price: $99.95

And now for something completely frivolous. Well, not really frivolous – actually quite the opposite. In the unlikely event that you haven't noticed, comics are big business. After all, how many daily or weekly newspapers are there that do not have a comic section? Today's comics are a popular form of entertainment for children of all ages. Comic collecting is BIG business; just ask our publisher, he knows all about it. On the serious side, the comic strip is an excellent way to quickly make a point, and of course we must not neglect the political cartoon. As such, when the maker of a leading desktop publishing package issues a program which is dedicated to the creation of comics, we have no choice but to take a careful look at it.

Although related to both desktop publishing and general purpose drawing programs, comic creation has its own unique requirements. In fact *Comic Setter* combines many of the page layout features from desktop publishing with some of the structured drawing techniques used by CAD programs, along with a smattering of bit map graphics tools, into a package ideally suited for comic book creation.

The first step in using *Comic Setter* is to select your printer. *Comic Setter* needs to know your printer's resolution in order to properly size the page. This information is embedded in the printer drivers which are used by Workbench 1.3, which at press time had finally been released by Commodore. Our copy of *Comic Setter* came with a prerelease gamma version of Workbench which refused to work with our Canon PJ-1080A color inkjet printer. However, we were able to get it running with a slightly later gamma release

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just days before Commodore officially issued the new Workbench. The ways of the imp of perversity are truly devious.

The first step of comic creation with *Comic Setter* is the Add Page selection which is found in the layout menu. This brings up a requestor which lets you set the page size, the panel layout, the between panel gaps, and the margins. Default values are provided with the option to set your own. You can also choose to manually lay out your own panels.

The first time you use *Comic Setter*, take a careful look at page dimensions. *Comic Setter* erroneously assumed that our Canon PJ-1080A had a print line which was over eight inches wide. It actually can print about 7.7 inches at 83 dots per inch. This quirk is probably unique to the Canon PJ-1080A, which is a popular printer in the Amiga community.

Although printing is the last thing you will do, we will talk about it first, as everything in *Comic Setter* ultimately leads up to a printout. *Comic Setter* does all its printing out via Workbench. With the advent of version 1.3, this is a good thing, as it insures that new printers will be supported as soon as a driver becomes available for them. The 1.3 printer driver also has enough built-in features that using it no longer presents a restriction to the programmer or the user. It includes control of the scaling or proportions of the printouts, selectable density of the printout for those printers that support it, three types of shading for generating colors or gray scales, and optional smoothing.

All of these printing options, which appear on the Amiga's Preferences screen, show up on *Comic Setter's* print requestor when Print is chosen from the project menu. If these choices are not sufficient, you also have the option of saving the completed page as an IFF bitmap for subsequent printout by your favorite printer utility. For example, the bitmap can be imported into Gold Disk's *Professional Page* program for color separation.

Internally the graphic bit map is only a small part of the document which is maintained by *Comic Setter*. A *Comic Setter* document is made up of one or more pages, each of which contains one or more panels. The actual drawings or objects are then placed on the panels. Objects are normally constrained to the confines of a panel; however, you do have the option of lifting this constraint. Other than the available memory, there is no limit to the number of documents, pages, panels, or objects which can be handled by *Comic Setter*. About the only constraint we came across is a maximum page size of 1008 by 1008 pixels.

The *Comic Setter* working screen consists of a menu bar across the top with a tool palette down the left side. The tool palette can be turned off, via a menu selection, to show more of your working image. Four levels of magnification are provided, ranging from a full page to 50%, 100%, and 200% for close-up work. The cursor's position on the page is continuously displayed in the menu bar using either inches, centimeters, or pixels. *Comic Setter* also gives you the option of doubling the display by turning on interlace.

Comic Setter manages several types of objects which are used to create images. Images are created by layering objects in a panel. Each object has a transparent color which can be independently selected. Objects can be scaled and moved about in relation to one another. The display order of the objects in a panel can be changed by using the front-to-back tools in the tool palette when an object is selected. Multiple objects and panels can be selected for group operations.

Bitmapped objects are what we have become accustomed to from using conventional drawing packages. You first define a blank bitmap object, then proceed to draw using the tools provided. These include freehand drawing, airbrush, fill (from 25 patterns which are provided), smear, connected lines, rectangle, ellipse, and Bezier curves. The latter is a freehand curve based on four points. *Comic Setter* lets you link Beziers to create curves based on any number of points.

Bitmapped objects can also be imported from an IFF image file as long as it is not in HAM mode. Note that *Comic Setter* is also limited to working with 16 colors with full palette control. When importing a bitmap you scroll a window which is the size of the blank bitmap object over the image until you have the portion that you want. Or you can use a polygon tool to cut out any irregular portion of the image.

Once drawn, bitmapped objects can be modified and scaled. When scaling a bitmapped object, all of its pixels are multiplied or divided accordingly. Thus enlarging a bitmapped object does not add detail, while reducing one may remove some detail.

Structured objects are mathematically defined within *Comic Setter*. They consist of data such as points, connecting lines, line weights, fill patterns, and so on. Thus structured objects can be scaled without any loss of detail. Structured objects also take up less disk storage space. Each structured object is an independent entity. For example, it is possible to adjust a segmented line by moving the end points of the various line segments.

Since *Comic Setter* maintains all objects in memory as individual entities, it takes longer to update the screen than is possible when displaying a simple bit map. In general screen updates take from two to five seconds, depending on the number of objects and the display resolution. Screen updates occur whenever *Comic Setter* detects a change to a displayed object or a movement of the screen display. At times it seemed as if *Comic Setter* was updating the screen for some reason which we could not detect.

Scrolling about the page also took some getting used to. *Comic Setter* uses the conventional Amiga gadgets consisting of sliders for large movements and clickable arrows for fine positioning. When scrolling the screen we had to exercise some restraint of the mouse clicks, as *Comic Setter* remembered every one. Since it can take some time to scroll the screen, we found ourselves going a lot further than anticipated due to the many mouse clicks.

Text objects consist of two parts, a balloon and the text. They can be created as either a bitmapped object or as a structured object, but watch out. Once created as a bitmapped object you will lose the ability to edit the text or adjust the balloon. *Comic Setter* lets you use any Amiga fonts for its text. The distribution disk also includes three *Comic Setter*-specific fonts. Text may be entered left or right justified or centered. Overall text style can be altered via the menu, or local text style can


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Comic Setter *comes with a companion disk of clip art objects grouped as characters, backgrounds, and props. Also offered are supplementary two-disk Comic Art sets, including Funny Figures, Super Heroes, and Science Fiction.*

be controlled via embedded commands.

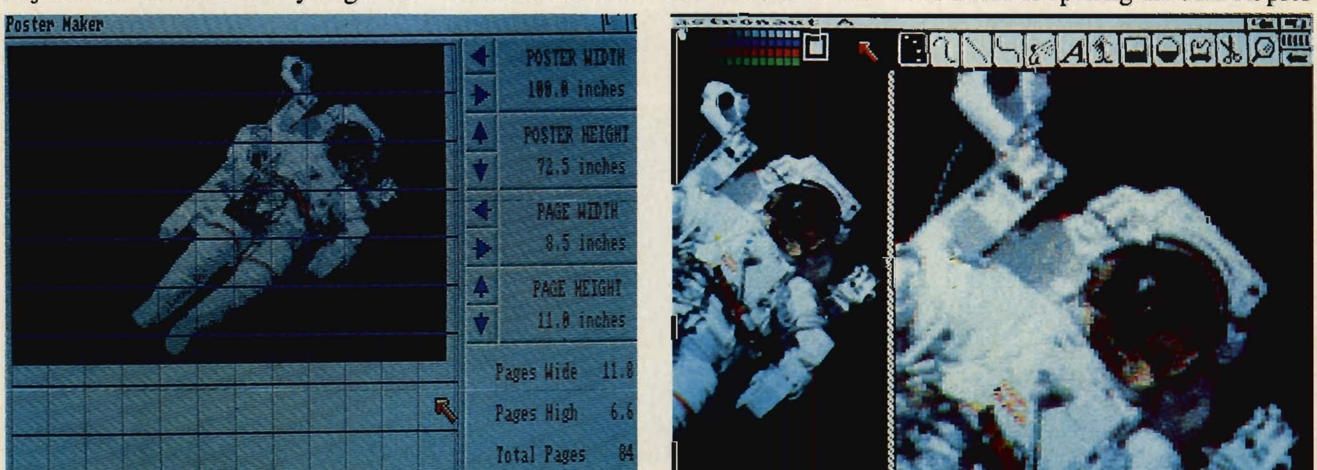
Each object is surrounded by a dashed rectangle which is visible when it is active. This rectangle includes eight adjustment points in addition to all the adjustment points which are already part of a structured object. The adjustment points, which are part of the object's frame, let you scale the object. To grab a point you have to click right on it with the pointer, something which is not always easy to do as the points may be difficult to distinguish from their surroundings. If you miss the point you will either end up picking up the object (the pointer changes to a hand) and moving it around, or dropping it entirely if you click outside the object. You can tell when you get the point, as the pointer changes to a cross hair. If you lose track of an object, the menu selection which makes all boxes visible may help you find it. This option will normally be turned off, as the screen can become cluttered with boxes as the number of objects builds up.

We have already indicated how *Comic Setter* uses the standard Amiga menus and the tool palette for most of its operations. In general, working with *Comic Setter* will be pretty intuitive for experienced Amiga users. Some *Comic Setter* operations require keyboard modification by pressing either the Control key, an Amiga key, a Shift key, or an Alt key. Since you also have to use the mouse, you may occasionally encounter a minor incident of awkward hand placement. The keyboard modifiers take some getting used to. Fortunately there are not very many of them.

When you save a *Comic Setter* file, it saves the complete information for each object. You also have the option of saving the page as a bit map. If you feel that you have completed a panel, you can also collapse it to a bitmapped object. This could clear up the clutter of a large number of objects in a panel. Of course IFF bitmaps can then be read by other graphics or printer programs for subsequent modification.

In addition to the object creation tools, *Comic Setter* has a complete set of page editing commands. Menu selections allow objects to be Cut or Copied to a buffer from which they can then be Pasted. Objects can be Erased, Duplicated, and Flipped. Many operations can be Undone. Pages can be Moved or resequenced, and they can be Deleted. Objects and panels can be selected for group operations, and they can be locked to make them immune from changes. If a command is possible at a given time it will be clearly visible. Otherwise the menu selection will be ghosted.

Comic Setter comes with a companion disk consisting of various bitmapped clip art objects which have been loosely grouped as characters, backgrounds, and props. Gold Disk also offers supplementary two-disk Comic Art sets, of which we have seen Funny Figures, Super Heroes, and Science Fiction. Utilizing these clip art disks and some supplemental text, we were able to create a complete comic page within two hours of opening the box. At pres-



DeluxePhotoLab *lets you create and edit HAM pictures larger than the screen—as large as you like, within memory constraints.*

ent, *Comic Setter* does not have the ability to import structured objects, which seems like an interesting idea.

The version 1.0 release of *Comic Setter* which we looked at was not completely bug free. When we gave *Comic Setter* some impossible printing parameters it simply dropped out of the print mode without any indication as to what the problem was. On several occasions we also found that *Comic Setter* had lost track of the bit planes, as evidenced by the loss of color registration, in some of the objects. Our Executive Editor also encountered the Guru on several occasions while preparing the *Comic Setter* page which graces this month's cover. In view of Gold Disk's previous track record, we expect to see a corrected upgrade by the time this review hits the stands.

Comic Setter comes with a nicely written, indexed, easy to follow manual which includes a tutorial section to get you started. Be sure to go through the entire manual, as many things are not easy to find in spite of the index. For example, "scaling" is an index entry as a subtopic under "object." This sort of thing means you have to know where to look before you can find an entry in the index. The manual could also use some additional discussion on the proper use of printers and how printer resolution relates to what you see on the screen.

Overall *Comic Setter* was fun to use, with many features which are just not available on any other Amiga graphics package. Its ability to import IFF files effectively places your favorite graphics program at its command. Its page manipulation and panel layout capabilities are ideally suited for comic creation. Once we got past the quirks in this first release we were surprised to find that we really enjoyed working with the program.

Gold Disk, P.O. Box 789, Streetsville, Mississaugua, Ontario, Canada L5M 2C2 (phone: 416-828-0913).

–Morton Kevelson

Circle #284 on Reader Service Card

DELUXEPHOTOLAB

Electronic Arts
Amiga with 1 megabyte
Disk; $149.99

When the Amiga was quite young, its full 4096-color palette was accessible only through digitizers, and the peculiar "HAM" look of those pictures was instantly recognizable by their often objectionable haloing of adjacent, contrasty colors. Now, a full three years into the Amiga's existence, HAM paint programs have started looking more like regular paint programs, and with *DeluxePhotoLab* fresh on the market there is finally little different between painting with 32 colors and painting with 4096.

Speedy and solid, *DeluxePhotoLab* manipulates the complex HAM mode as easily as other programs handle vanilla palettes. The Amiga's full 4096 colors are, at last, as fully user accessible as any of the other Amiga display modes. No muss, no fuss, no bother.

It Took Time

It's no wonder that it took awhile for HAM paint software to be fully developed. The Amiga's celebrated HAM mode is a very complicated creature. Affectionately known as "HAM," Hold and Modify means just that. The Amiga puts down a pixel and holds its colors, indexing each succeeding pixel off the previous one.

Although this may sound simple, getting this to work in real time "on the fly" in a paint program requires some pretty ingenious programming. Nevertheless, *PhotoLab* is up to the challenge. The complexity of the HAM mode is almost completely transparent to the user.

Electronic Arts' *DeluxePhotoLab* follows in the tracks of the company's venerable *DeluxePaint II,* with which it shares many features, its main "look and feel," and even its default screen colors. Indeed, many of *DeluxePaint's* key equivalents work the same in *PhotoLab*–a very welcome feature. In addition, *PhotoLab* takes electronic picture making a few giant steps further, into the elusive HAM painting modes, offering quite a number of options for very subtle color mixing and brush manipulation.

Besides the paint program, *PhotoLab* comprises a very elaborate palette manipulation program, Colors, as well as Posters, a program for printing multiple-sheet versions of your Amiga art creations, up to 100-square-foot billboard size. Besides all this, *PhotoLab's* Paint program provides a method of converting what you have to what you want, in terms of number of colors, or screen resolution, or display mode. The conversions are intelligent ones, for the most part, not just chopping and cropping.

Halfbrite, Too

If you want to work with 64 colors on the screen at a time, *DeluxePhotoLab* is one of several Amiga products that will do painting in the Amiga's special Extra Halfbrite modes. This is also a six-bitplane mode, employing 32 colors of the user's choice and another 32 colors that are half the brightness of the first set. In other words, there aren't 64 separate colors, but 32 and halfbrights of those 32.

Early Amiga 1000 models may not have halfbrite capability; however, Amiga service centers can change a chip (about $60 plus labor) to bring the machines up to date if you really must have the extra colors. Amiga 500's and Amiga 2000's are all born with the halfbrite chip. All Amigas have always had HAM mode.

Not All Features

Notwithstanding its impressive list of features, *DeluxePhotoLab* doesn't embody all the features of all Amiga paint programs. For example, *DeluxePaint's* handy perspective option is not reflected in *PhotoLab.* And *Photon Paint's* (MicroIllusions) ability to wrap a brush around an object? Have to buy *Photon*–so far.

Still, *PhotoLab* incorporates many tricks that the others don't (yet) have, or improves on them in one way or another. In short, even though *DeluxePhotoLab* is the current state of the art in Amiga HAM (and regular) paint programs, you can't buy just *PhotoLab* and expect to have it all. Neither can you buy any one of the computing products, of which there are many, and expect to have it all. Is this a plot, do you think?

Super Bitmaps

Until *PhotoLab,* HAM pictures were Amiga screen sized and no bigger. Scratch *that* limitation! *PhotoLab* lets you load, create, or edit HAM pictures larger than the screen–so-called super bitmap images. Within memory constraints (natch!), you can work on images as big as you like. *PhotoLab* was

the only product in the author's collection that would edit the 1008 × 792-pixel, 16-color images generated by Gold Disk's *Comic Setter* program.

In addition to superbitmaps, *PhotoLab* lets you have multiple screens open at once, in any number of resolutions and modes, and it offers the ability to cut from one picture and paste into another, even if the palettes and resolutions don't match up.

You read correctly. The program makes whatever conversion is necessary. If the palettes don't match (do they ever?), the program either adds them to the list (in HAM mode) or remaps them as best as it can, giving the user the opportunity to exercise judgment in these matters, too. To convert resolutions, the program performs intelligent image processing to produce as good results as it can. This feature can be time consuming on some conversions, but the results are well worth the wait, since much pixel-wise twiddling would often be needed to make the adjustments by hand.

Along this line, too, *DeluxePhotoLab* permits the unusual trick of loading a picture *into* one that's already onscreen without clearing what's there—again, even though the one being loaded is not of the same resolution or palette. The X-Y coordinate method of telling the program where to start the load could stand some additional mouse-izing here, but trial and error (UNDO!) will work.

A Few Small Problems

PhotoLab appears on the Amiga screen in a very complete state with very few problems. Indeed, with an expanded memory (1.5 megabyte) Amiga, it was possible to crash the program only by a concerted effort. (Dirty job, but somebody had to do it.)

The surest way to kill any program is to starve its memory needs, of course, and *PhotoLab* is no exception. The program will permit the user to open a screen which cannot be closed, after which the program is stuck, too. It still works, but can't STOP working!

The problem is that Amiga Intuition can't appropriate enough memory to create the pulldown menus—therefore, no pulldown menu option to "Quit" or "Close." Since you can't close the screen, you can't free any memory, so you can't quit. If you have something else running in the Amiga *(PhotoLab* multitasks happily), you can sacrifice it to get control of *PhotoLab.* However, if you've soaked up the very last byte of your memory, you're pretty well stuck. The program will stubbornly allow you to paint away, but you can't use the menus. You can save your work, though, since that can be accomplished with a key equivalent to the pulldown menu.

PhotoLab runs in a megabyte of memory or more. It will run in slightly less, but not in 512K. A meg is plenty, though, even permitting multiple HAM screens for cutting and pasting.

No matter what mode you're painting in, the program stores its HAM palette on a separate, 320 x 100 screen. There went 24K of memory, even if you're doing only one-bitplane, black and white pictures. The separate screen for the palette is also a teeny bit clumsy. Since it doesn't reside on the same screen with the picture you're working on, you have to keep clicking back to it to adjust the palette, pick a color, mix colors, etc. A handy keyboard shortcut helps out here, but it would be nice to have the palette more accessible.

As a compensating factor, the program's palette screen is very painteresque for mixing colors in non-HAM modes, and its 128-step spreads can be very useful for subtleties that only HAM permits. The program will spread a color range through the rainbow, or through a greyscale. Your choice.

Although *PhotoLab* can swap resolutions and palettes around with ease, it is not as convenient for doing so as *Butcher* (Eagle Tree Software) or *PixMate* (Progressive Peripherals and Software). If you don't already have one or both of those, though, *PhotoLab* will do that job nicely, if a bit slower.

Slow, too, is the word for *PhotoLab's* flood fill operation. *DeluxePaint* is slow, but *PhotoLab* blazes new trails in snailspace on this one. This is, however, not a major limitation of the program, especially in view of its other, stellar features.

The Other Programs

Impressive as it is, Paint is not the only program in *DeluxePhotoLab.* You also get Posters and Colors, smaller programs with more specific uses. Although Paint has its own, fully featured print facility, the posters program goes the extra mile. Well, make that the extra FIFTEEN miles!

Posters prints posters. You load up your printer with plentiful paper, set Posters to printing, and go out for pizza. It'll be a while, but the result is a mosaic of graphics sheets that you can paste together (double stick tape makes nearly invisible seams) into a large display up to billboard size or anywhere in between.

With Posters' "smoothing" option

turned on, the program goes to a great deal of trouble (and time) to make curves and lines out of the stairsteps you'd normally expect from a greatly enlarged bitmap. The option works beautifully, but it drastically increases the calculating time. Order two pizzas if your poster is a large one.

Posters allows the user to set the size of the paper to be used, to preview the picture on a graphic grid, and to stop and restart wherever, whenever. Digital Creations (of *Gizmoz* and *SuperGen* fame), who wrote *DeluxePhotoLab*, displayed a ten-foot-wide color print done with Posters at AmiEXPO in Los Angeles. The print was made on two computers, each printing different sections of the picture, yet the pages matched up perfectly.

The Ultimate Palette Requester

To make changes to the palette of your pictures, whether or not they were created with Paint, *PhotoLab* also includes the Colors program, a stand-alone color palette presto-chango thingy. The program performs about the same task as PixMate's Color Bias option, but it works its magic on HAMs in a much better manner, and offers some elaborate—and hard to understand—extra options. Even so, Colors' work with HAM palettes succumbs somewhat to the complexity of the HAM mode, and the program makes errors in stepping back from where it has gone, if you decide you went too far. The best bet for using the program on HAMs is to study the picture carefully before taking any action, and frequently save the work in progress.

So...what does all this have to do with a *PhotoLab?* Not much.

Although Electronic Arts' advertising hints at being able, with *DeluxePhotoLab*, to retouch professional photographs, such a feat is currently beyond the hardware and software capabilities of the out-of-the-box Amiga. If you get right down to reading the ads carefully, they don't actually SAY you can do professional photo retouching. They just skillfully let you assume it.

The fact is, you can't do professional level photo retouching with *PhotoLab* or anything else on the Amiga. Yet.

The *PhotoLab* program *is* useful for retouching digitized photos. Indeed, the most frequent users of the Amiga's HAM mode are the digitizers that take video camera images and convert to pictures on the computer screen. You can digitize in 32 colors, or 64, or 2, but the HAM mode provides the digitizer with the widest palette with which to portray what its electronic eye is seeing.

Frequently, digitized pictures have little (ahem!) "problems" that need to be fixed. Also, there may be things in the picture—that utility pole growing out of Aunt Martha's head—that could stand some judicious editing. HAM paint mode to the rescue.

To its credit, *PhotoLab* includes some very powerful "fill" modes and a complex but powerful "shade" mode that will make repairing digitized pictures a breeze—once you master the program's options. They're complicated, and will require not only poring through the manual but also a good bit of experimentation to boot. Yet, for some things—like simulating aging graffiti on digitized bricks—they will be indispensible.

Like any tool, *PhotoLab* won't do you much good till you learn how to use it, and the most powerful of its software tools *do* require some study and effort.

How About the Docs?

PhotoLab's documentation is of the "big wire-bound book" school of thought. It's good, thorough, and complete, though it could use some amplification on some of the more complex features like "shade". The examples given are mostly relevant and instructive. A particularly nice addition is the details of how the program's sample pictures were created. Very considerate.

The book includes good, step-by-step tutorials, as well as a complete reference section and an index. It is the kind of quality documentation you would expect from the likes of Electronic Arts. Read the book thoroughly, and don't depend too much on getting phone help from the company. They're willing, but you'll spend a long, expensive time getting through their adventure game style switchboard to someone who can help.

Summary

DeluxePhotoLab is just that. Deluxe. It comprises three useful and powerful programs for creating, manipulating, and printing Amiga pictures, and its features and capabilities list is a mile long. A Photolab, however, it is not. It's MUCH better!

Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404 (phone: 415-571-7171). *—Jay Gross*

Circle #111 on Reader Service Card

Back Issues of *Ahoy!'s AmigaUser* are available for $4.50 each. See page 69.

THE TOOLCADDY DOCS 2.0
The ToolCaddy Works
Amiga with 512K
$39.95 per disk

The ToolCaddy Docs comprises three separate disks of online utilities for the Amiga assembly language programmer. As a group they cover the Motorola 68000, 68010, 68020, and 68881 chips. Individually they work as follows: the Functions package discusses system library function calls, the second (Structures) covers system structures, and the last (Mnemonics) handles Motorola 68XXX mnemonic commands.

Each package contains one non-protected disk and a registration card. The reverse package side acts as the manual, explaining how to make a working copy of the disk, and more important, how to operate the programs with single floppy, dual floppy, or hard drive systems. It also throws in some extra information, namely the existence of sample assembly source code (which can be added to your programs via *TCD's* cut and paste routine).

However, the real strength behind these utilities, which don't do much more than repeat information found in printed manuals and reference guides, is that they reside behind your text editor–available with just a press of the left Amiga key and the right mouse button. Once displayed, you merely select the proper topic for instruction, sample code, or online tutorial.

Convenience like this is priceless. Just think, no more fumbling through stacks of reference manuals looking for the right one; no more flipping through endless pages in a poorly indexed guide trying to find the only mention of a command you'll never need again; no more lost time!

A Little Detail

Besides working with a combination key press/mouse click, the utilities may be called by accessing the front screen/back screen gadgets or sliding screens up and down.

TCD ties its utility display screen to the text entry screen that was visible when the utility was invoked. Keep this in mind when working with multiple text entry windows; the utility screen you can't seem to find is probably tied to a currently inactive window.

The previous statement is true unless you have pressed ESC or CTRL-C while viewing *TCD.* In these instances, *TCD* has been deleted from memory and it's reload time.

Restoring *TCD* into RAM is the same as the original entry process; typing the CLI command RUN dfx:TC Docs followed by a RETURN. (In this command, "x" specifies the floppy drive where the disk will be found when the utility query is activated.)

Tips, Source Code & More

In addition to the statement (command) usage information from sources like Motorola's Programmer's Reference Manuals and the Amiga ROM Kernal Reference Manual, required data return values are noted. This helps complete the loop when working with uncommon statements, or for the novice, any statement or command.

The ToolCaddy Docs provide 21 executable utilities and 18 examples of assembly language source code. The utilities ease programming chores while the assembly language source code can help solve particular problems. The code may be reviewed as an aid to building your own solution, or it can be incorporated into your code –there's no need to cite copyright or pay fees (one time or royalty).

Seven lessons are also included. These range from explanations and information on AmigaDOS and the EXEC statement to briefings on Intuition and Graphics. System and binary file structures are likewise incorporated, the entire set of lessons providing a comfortable level of detail and usefulness.

The Structures disk also has files which can be transferred to your own. The display reads from left to right, in 6 columns. The first notes the Data Definition Directive (DC.L, DC.B, etc.); the second column is where you enter data to be defined. The third provides the relative offset in hex and the fourth denotes the type of data defined (ulong, APTR, WORD, etc.). The fifth column displays the name of the offset according to the "INCLUDE" files (gg__Activation or do__Type for example) and the final lists the offset alternate name (do__Gadgetf or gg__NextGadget for the offset names above, respectively).

The mnemonic side of the triad is perhaps the weakest. To make room for general information such as an AmigaDOS error listing, hardware register addresses, and RawKey codes, only an abbreviated mnemonic set has been culled from Motorola's Programmer's Reference Manuals. What is provided, however, cites specific examples, conditions, and criteria.

One point must be made before we go any further. While the review disks are production versions, they did not contain complete INCLUDEI or any INCLUDEH files. A note attached to the disk said this situation would be remedied by 10-1-88. Make sure copies you buy have INCLUDEH files, the surefire way to determine completeness.

USING *TCD*

TCD makes use of the mouse and the function keys. Clicking the mouse on a topic title displays the desired details. Moving away from the list of topics, you can click the right button on the upper or lower part of the screen to page up/page down. Function keys handle chores such as cursor movement (page up/page down, beginning/end of

file), print file (F3), cut and paste (F4), and start a new CLI (Fl), to name the most important.

Despite the apparent multitasking of the Amiga, and the demonstrated ability of *ToolCaddy Docs* to reside behind the text editor, you cannot load all three disks at the same time. The last to load replaces the previous set of files. Memory notwithstanding, you cannot load all three simultaneously and switch between them with a combination key press/click.

There is another vehicle for switching between disks. Each disk has an index of its own topics plus an EXEC topic which loads either of the other two disks—one at a time. Before selecting the alternate disk, you must insert it into the drive where the other disk is located. (This is the recommended way, the way *TCD* was designed to operate. As with other nonprotected software, you should be able to load all three disks into a RAM disk and put the Assign command to good use.)

Hard disk owners can copy all three disks to the same directory and use the EXEC command as above—without swapping floppies, of course.

The idea of providing free sample source code is good; the cut and paste approach is even better. There is, however, one fly in the ointment. Repeated use of this function can be time consuming, potentially taking longer than the time required (by an average programmer) to write three or four lines or code. Let me explain.

The entire operation goes something like this. Once you've moved to the desired piece of source code, press F4. This cuts the entire page from memory and places it in df0's t directory as a file named BLOCK. Then you have to click back to the text editor and load or retrieve the file. *TCD* recommends opening another window in the editor to do this. I did it with one window as well as two; there's no real need to open the second window. If you do as recommended, you must cut and paste the code into the first window anyway, so why bother with the extra steps?

By now you have the source code in the editor, but there's all this extra stuff clogging up that beautiful routine. What can it be? Why, it's all the information on the source code screen that is not source code. Surely this won't run; so it's got to go. Time to edit.

With *WordPerfect* I would take a chunk of information and highlight it. Everytime I encountered the horizontal topic dividers composed of EQUAL signs (=), *WP* wanted me to clarify hyphenation. This happened three or four times for every piece of source code, so I wound up highlighting entire pages at a time, accepting *WP's* default hyphenation solution and then going back again to highlight and cut unwanted information. Add that editing time to the file retrieval time and it's questionable whether or not you're actually more productive.

There is another drawback to the current method. You can only cut and paste one file before retrieving it, since *TCD* automatically names the file and places it in the same place every time. Hence, each new cut writes over the previous, making it impossible to cut several files at a clip and then perform multiple retrieves from the editor—without repeatedly switching back and forth.

The real solution requires *ToolCaddy Works* to go a bit further; perhaps we'll see it in the next release. Namely, let users select source code only, cut, switch to the editor, and paste.

One thing done to perfection is the low RAM warning. In case you've written an opus (or have your memory otherwise occupied), *TCD* will notify you that there is a potential problem. *TCD* will even self-terminate to prevent a crash due to insufficient RAM. Excellent.

Compilation

Despite some process flaws, *ToolCaddy Docs* is an above average collection of reference material, tips, and general information. Serious assembly language programmers (as if there were any other kind) will find it invaluable.

The ToolCaddy Works, P.O. Box 5873, Laughlin, NV 89029-5873 (phone: 702-298-4252). *—Ted Salamone*

Circle #285 on Reader Service Card

MAGELLAN

Emerald Intelligence
Amiga with 512K
Disk; $195

Magellan is a shell for building expert systems. Although artificial intelligence (AI) research began with goals of building generally intelligent systems that could sense and learn by themselves, today's AI research typically has much narrower goals. Since the late 1970s, one of the commercially viable products of AI has been expert systems.

Expert systems hold significant amounts of "knowledge" about specific areas and apply that knowledge to a given task. *Magellan* does not provide you with any ready-made expertise. It is, rather, an interface for developing and storing expert knowledge, an engine to derive inferences from that knowledge, and a user interface to allow the non-expert to benefit from the knowledge. *Magellan* lets you create an

"intelligent assistant."

Expert systems have been used to suggest antibiotic therapies to physicians treating infections, to advise physical chemists on chemical structures, and to diagnose oil drilling problems and recommend solutions. *Magellan* is a professional tool useful for building expert systems for business, scientific, and academic settings. *Magellan* is not a toy—like *Racter* or *Eliza,* nor is it a programming language—like PROLOG or LISP.

Magellan makes building an expert system easier. I can't say "easy" because the heart of building a system is the "expert" knowledge or rules you put in. Dragging the "rules of thumb," or heuristic knowledge, out of a human expert is sometimes difficult. Humans can't always articulate what they know and often can't quantify the degree of certainty they attach to the heuristic rules they've learned through experience.

Since heuristic knowledge is really the art of making good guesses, you'll have some real work in defining accurate rules for *Magellan*. Once you do know the rules, however, *Magellan* is a great assistant for assembling them into a knowledgebase. You enter rules in a simple IF-THEN format. *Magellan's* IF-THEN rules look like programming, but they are different. A programmer uses IF-THEN to specify steps for the program to follow. An expert system uses IF-THENs to derive new data and verify it against the system's knowledge.

The syntax is set by *Magellan's* "rulebuild" screen. IF and THEN are each followed by four boxes. For each, you enter the object, attribute, operator, and value. An example will help:

	Object (subject)	Attribute (qualifier)	Operator (verb)	Value (predicate)
IF	person	in uniform	is	mailman
THEN	dog	action	is	bite

Writing several rules, you will begin to link facts together—some general and some specific. In our example, other rules might describe a uniform, tell where the dog is likely to bite, etc.

Several features of *Magellan* make rules like this much more powerful than they may at first appear. First, both the IF and THEN parts of a rule may have decimal values assigned to



Exploration of artificial intelligence.

them. For IF, this number represents the minimum threshold you set for a condition before the rule will be acted upon. In our example, a 0.5 value would mean you must be 50 percent certain the person in uniform is a mailman or *Magellan* won't continue to THEN. For THEN, the decimal value is the probability, or percent certainty, that the dog will bite if, in fact, the person is a mailman.

Second, *Magellan* can evaluate rules with operators besides "is" or "is not." *Magellan* is fine with mathematical operators like greater than, less than, and not equal. Also, individual cells can hold variables representing floating point numeric values.

Third, the THEN (result) clause of your rule can not only contain a fact, it can also direct *Magellan* to take an action. That action might be to EXECUTE an AmigaDOS command, run an animation, send text to the printer, run another *Magellan* expert system, display a help screen, or solve a mathematical equation and store the result in the object/attribute boxes.

Fourth, although simple rules are preferred, a single rule may have up to five IFs and five THENs, each with its own threshold or certainty value. IFs may be logically linked by AND or by OR. THENs are all linked by ANDs. So you can write a rule that says:

	IF condition 1 is true
and	IF condition 2 is true
and	IF condition 3 is true
or	IF condition 4 is true
	THEN perform action A
and	THEN perform action B

With this rule, whenever 1, 2, and 3 are true, both A and B will happen. Or, when 4 is true, A and B will happen. You can see the power inherent here. (You can also see why building a knowledgebase is WORK.)

Fifth, you can define default answers to assist the user. Let's say that in our "dog bites man" example, *Magellan* will ask the user what kind of clothes the person is wearing. With an open-ended question like that, the user could give an answer that would not be helpful to *Magellan*. So you can define some "legal" answers—such as "suit," "dress," "uniform," and "casual clothes." *Magellan* will display these when it asks the user to describe the person's clothes. The user can simply click on the best answer. This feature goes a long way toward alleviating the problem expert systems have with being brittle, or falling through the cracks—like when a user types a term the system doesn't know.

Sixth, *Magellan* keeps a list of the words you use and the context of each occurrence. You are able to check this list for consistency, edit words, and add synonyms.

Seventh, *Magellan* warns you of recursion, or circular reasoning. Anyone who has worked extensively with spreadsheets knows this problem. Cell B1 = A1 + 1, cell C1 = B1 + 1, cell A1 = C1 + 1. Recalculate and everything grows. *Magellan* prevents you from writing IF-THEN rules that would result in the logically equivalent trap.

Eighth, *Magellan* accepts "generic" rules. You can specify "IF (something) is glass, THEN (something) is fragile." This is similar to the way humans think/learn, and in some cases will prove a very powerful feature because it allows a dash of abstraction.

So, you can build all this power into *Magellan's* rules. But once the rules are input, does *Magellan* tie you down? Absolutely not. You can pull up any rule to edit. Start with simple rules, test them out, and when you're sure they're OK, add complexity. *Magellan's* rules

are not compiled, so there are no multistep processes to go through. Debugging, while never a pleasure, is as easy with *Magellan* as it's likely to get.

Once you have entered all your rules and built your expert system, you can really put *Magellan* to the test. It provides three modes of operation—backward chaining, forward chaining, and "synergistic inference."

Backward chaining is goal driven or hypothesis driven. You state the goal you desire and *Magellan* looks backward trying to establish the necessary conditions. You ask why the car stopped. *Magellan*, after asking questions, might backchain to an answer like "It is out of gas." Backward chaining is top-down reasoning and is considered to be the way humans often solve problems. It's generally the most useful mode for expert systems.

Forward chaining is event driven or data driven. A condition is true, so an action is taken. You might tell *Magellan* the car is nearly out of gas. It could respond that you will be stranded on the highway. Forward chaining predicts outcomes.

Rule priorities are based on order of rule creation due to the way rules are stored in version 1.0. Where multiple values are involved, the current cell value (rather than the one with the highest certainty) will be stored.

Magellan does not combine forward and backward chaining into what AI types call "means-ends analysis," a much more sophisticated mode. *Magellan* does, however, have what it calls "synergistic inference." What *Magellan* will do is backchain, based on the info you provide, until it reaches a resolution. Then based on that resolution, it will forward chain and list all the outcomes it can. You say "The car stopped," then answer *Magellan's* questions. It backchains to "You're out of gas," then forward chains to "You are stranded on the highway," "You need money to buy gas," and any other results it can derive from its rules.

Magellan allows you to store snapshots of values that might be entered into an expert system, and later pull those snapshots up—simulating backchaining—to save the user time and trouble. *Magellan's* rule-building syntax is so formal, it is able to phrase its questions to you in English that actually makes sense. Again, *Magellan* recognizes that real people (users) will have to deal with the expert system you build.

Magellan can also explain its reasoning process. If you don't understand a question it asks, just click on the "Why?" gadget. *Magellan* displays its original goal, the current subgoal, and the rule it is working on. Or you can select "Trace" to force *Magellan* to show its full path of reasoning to the current point. Both options are useful for debugging, and "Why?" can be helpful to a user who gets a bit lost or isn't willing to accept *Magellan's* answer.

A feature *Magellan* does not support is inheritance. Actually, inheritance is a feature of frame-based expert systems and not rule-based systems. If you state that "Amiga is a computer," "Computers have RAM," and "RAM is chips," an expert system using inheritance can attribute characteristics of RAM and computers, drawn from other rules, to the Amiga.

As powerful as *Magellan* is, using it is not completely rosy. It's anomalous that a program so concerned with the use and transfer of knowledge has so many quirks in its user interface. It offers no easy way to control the appearance of the user's input screen or to automate running an expert system. Much of your work will be in *Magellan's* "dialog" window. But you'll have to click in another window first before you can use the pull-down menus and then reclick in the "dialog" window. Also, in the "dialog" window, you may select a rule to edit or delete by typing "Y (Return)." Nothing on the screen except your "Y" indicates that that rule is selected.

On entering the "rulebuild" window, your cursor won't appear until you click it in a box—it could easily default to the first box. When you edit a word, *Magellan* gives you no way to conveniently and simultaneously list the words you have to choose from. The file requester has no gadgets for drives and, when I asked for the files on DF1:, it skipped some names until I clicked the slider.

The "Undo" gadget in the rule edit window can only bring back a rule you have saved to a temporary file. It's not a true "Undo" feature. The copy option in rulebuild is somewhere between exasperating and useless. And the help option in the menu bar simply refers you to pages in the manual. Finally, the boxes for your rule-building input show 18 of the maximum 80 characters, but sometimes those characters are shifted out of view.

In all fairness, Emerald Intelligence is aware of most of these issues, as well as a few glitches in the manual. Sprucing up *Magellan's* user interface is high

on their list for Version 1.1. Other planned 1.1 features are ARexx support, scroll bars, and, maybe, a special interface to other applications. I might mention here that Emerald intends to supply free upgrades for the first year and will provide support through their BBS, as well as by phone (not toll free).

Emerald Intellilgence, which seems to be a small shop, evidences real commitment to *Magellan*. In the works are a port to the Mac, a research grant on parallel processing (with transputers), a possible version for the IBM running under Presentation Manager, and an Amiga developer's version.

The developer's *Magellan*, which will probably sell in the $600 to $1200 range, will provide significant enhancements and flexibility. For example, a developer will be able to select or design his own certainty algorithms, and may be able to explicitly prioritize rules. Also, the ability to share data among expert systems, through a blackboard or globals approach, will be strengthened, and some steps toward true pruning can be expected.

During the evaluation period, I did not have time to build anything but very small expert systems. In the AI world, fewer than 500 rules means small. Although Emerald Intelligence states that the theoretical limit for *Magellan* on an expanded Amiga is several thousand rules, the biggest functioning expert system built with *Magellan* to date is about 100 rules.

On a 512K Amiga, you should be able to build an expert system with 50 to 100 rules. The maximum depends on the number of multiple IFs and THENs, as well as the complexity of your statements. *Magellan* itself (after Workbench is loaded) takes about 265K. Based on my experience, I would warn you that by the time you hit several hundred rules, you'll be chomping at the bit for a hard disk and several megs of RAM. Remember, this is professional stuff.

Increasing the number of rules doesn't seem to degrade *Magellan's* performance. Still, the ideal way to operate is with your knowledgebase in a RAM disk. By the time you get to a hundred rules, I think you'll see time delays on a floppy-only system.

Magellan comes on a Workbench disk accompanied by a sample data disk. It is not copy protected. The 150-page manual contains a tutorial, options descriptions, index, and glossary. Although well-organized, I felt it could contain more useful information. *Magellan* is written in C with assembly language subroutines.

To assess *Magellan*, we must understand the limits of expert systems. Typically, they do not learn, they do not make comparisons or generalize, they give explanations based only on their rules and process, they do not exhibit common sense reasoning, and they are fragile—their abilities tend to fall off quickly outside their immediate area of expertise.

With human "knowledge" exploding at ¼ trillion words an hour, mere humans may have a tough time keeping up. The value of expert systems is measured by their abilitiess to perform at an expert level and to transfer expertise interactively. *Magellan* has the power and features to help you build systems that meet these tests of value.

Emerald Intelligence, 334 South State Street, Ann Arbor, MI 48104 (phone: 313-663-8757).

—Richard Herring

Circle #112 on Reader Service Card

DSM, THE MC68000 DISASSEMBLER V. 1.0d
OTG Software
Amiga with 512K
Price: $67.50

There's not much I can tell you about OTG's disassembler that's not covered in the manual, except that it works extraordinarily well. Come to think of it, the manual says that too.

Conceptually, the *DSM MC68000 Disassembler* performs a simple job. It translates executable code—a program—back into the assembly language from which it sprang. Experienced programmers need no more justification for this program. They'll understand the value of a good disassembler.

Almost everyone who uses his computer for more than letter writing and games will have taken some computer language for a test drive. Whether it was BASIC's Volkswagen, C's family station wagon, or assembler's Ferrari, a test drive may have been enough for you. Still, the fact that you're reading *Ahoy!'s AmigaUser* indicates that you probably have an insatiable desire to learn more about how your Amiga works.

You know that a programming language is merely a buffer between the user and the computer. Users tend to think of the big trip—just get to the destination. Our Amigas, on the other hand, must sequentially execute the smallest of steps. Computer languages provide an easy shorthand (relatively speaking) that allows programmers to tell the computer to perform its complex functions.

Some languages, like BASIC, have commands that tell the computer to take lots of little steps. On the other end of the scale, assembly language puts the programmer much closer to the computer's logic by providing more detailed commands. A single assembler instruction will typically cause the computer to execute a single instruction or two, and, for that reason, gives the programmer a much higher degree of control—especially where speed is concerned.

Unlike BASIC, before an assembly language listing can be run as a program, the listing (programmer's code) must be assembled into its component parts and those parts linked into a single executable program. So when you buy or download an assembly language program, you can't list it as if it were BASIC. The programmer's original code simply isn't there.

But whether a program is written in BASIC, C, or assembler, a user may want to look under the hood or even take a crack at super-tuning it. You might want to fix a bug, modify a printer drive, kill copy protection, or customize some feature. If all you have is the binary load program, originally developed in assembler, you're locked out—unless you have a disassembler.

A disassembler will give you *part* of what the programmer's original code looked like. *DSM* will break an executable program into segments and produce an assembly language listing with instructions, addresses, and data all accurate to the programmer's original.

You can study this to your heart's content, discover the tricks that the programmer used, and often see an example of compact, expert programming. (Disclaimer: Based on the license agreement, modifying, or even disas-

Continued on page 81

WHAT MAKES A MEGA-HIT? Intensify. You've seen arcade games evolve, and you demand state-of-the-art gaming. HYBRIS is so bold, so new, so incredibly filled with arcade action, it qualifies as the vertical shoot-em up game that will power you into the 21st century. HYBRIS marks the beginning of a completely new era of mega-hits. You do more than just play HYBRIS. You immerse yourself in action!



163 Conduit Street
Annapolis, MD 21401

ART GALLERY



The *Art Gallery* offers the opportunity for fame and fortune to aspiring Commodore artists. Send your work on disk to *Art Gallery,* Ion International Inc., 45 West 34th Street—Suite 500, New York, NY 10001. Label each disk with the date of your submission, your name and address, the number of images on the disk, and the graphics or paint program used. Graphics produced on the Amiga are eligible for inclusion in *Ahoy!'s AmigaUser;* C-64, C-128, and Plus/4 images are eligible for inclusion in *Ahoy!* If your image is published, you will receive a free one-year subscription. Current subscribers will have their subscription extended by one year.

Note that the *Art Gallery* is not a contest. Published pictures are selected in an arbitrary and capricious fashion by the Art Director, based solely on their artistic merit.











Bottom left: sure competition for the California Raisins is *Miss Jellybean* by Greg Wilcox (Minneapolis, MN). Above: *Dinos* by Jonathan Joshi (Jamaica, NY) depicts prehistory's classic confrontation between the Triceratops and the Tyrannosaurus Rex. Left: *Dreamer* by Glenn S. Adkins (Palm Beach Gardens, FL) looks rather like Alfred E. Neuman on mind-expanding drugs. At top right is *Yo-Sam* by Bruce Yarbor (Oklahoma City, OK) —who must see plenty of cowboys in his home town. Middle right: a vacationing *Alligator* (wonder what his luggage is made of?) by Neil Sorenson (Fayetteville, NC). And wrapping up this month's *Art Gallery* at bottom right is *Wrap It Up* by Roger McVey (Phoenix, AZ).



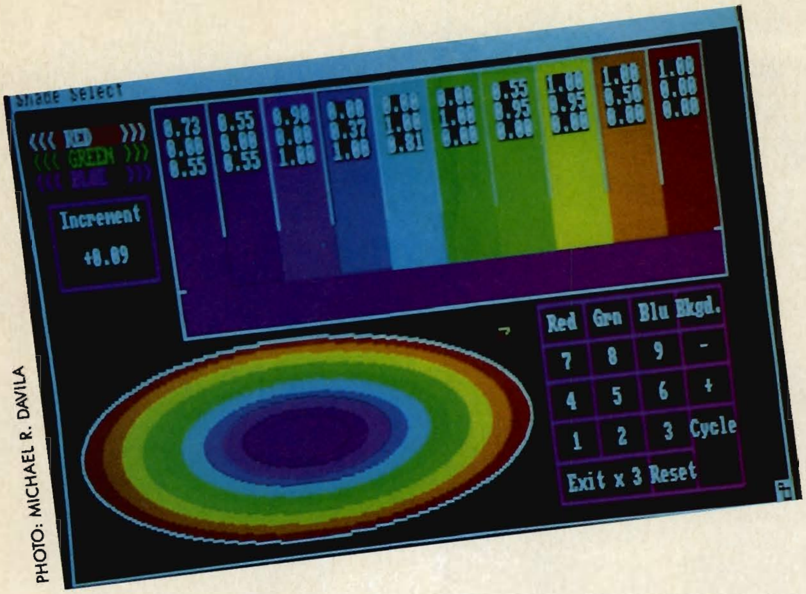


PHOTO: MICHAEL R. DAVILA

SHADE SELECT

A Color Control and Comparison Program

By Tom Griffin

The Amiga can produce 4096 shades of various colors. The *Shade Select* program will produce any of these colors, and allow up to ten of them on the screen for comparison. These can be separate colors, or hues of the same color.

The PALETTE command allows BASIC programmers the ability to control up to 32 colors on the screen at one time. The number of colors possible is limited by the depth and resolution of the screen.

Resolution: 320 X 200 allows 32 colors.
320 X 400 allows 32 colors.
640 X 200 allows 16 colors.
640 X 400 allows 16 colors.

Some palettes are reserved for the system. They may be used like any other palette; however, they will also affect the Background, Windows, and Pointer colors.

PALETTE# 0 = background color.
1 = window border color.
2 = window gadgets.
17, 18, and 19 = pointer colors.

KEY CONTROL MENU

A500/2000	Response	A1000 (optional)
KEY: 1-9	1-9	same
0	Exit	same
.	Reset	same
+	Positive input	same
–	Negative input	same
(	Red toggle	f1=CHR$(129)
)	Green toggle	f2=CHR$(130)
/	Blue toggle	f3=CHR$(131)
*	Background toggle	f4=CHR$(132)
Enter	Cycle colors	same

Warning! You're sure to turn several shades of green if you try to enter *Shade Select* without first reading your Amiga BASIC manual!

If after doing the necessary groundwork you still encounter problems, we'll try to help. Call 212-239-6089 (if busy or no answer after three rings, call 212-239-0855), weekdays from 8:30-4:30 EST.

```
Shade.Select:
  SCREEN 1,640,200,4,2
  WINDOW 1,"Shade Select",(0,0)-(617,185),1,1
  DIM R(10) , G(10), B(10)
  plus = 1:loop = 1:A = .23
  Rd$ = "<<< RED   >>>":Gr$ = "<<< GREEN >>>"
  Bl$ = "<<< BLUE  >>>":set$ = "#.##"

draw.screen:
  PALETTE 0,1,1,1
  PALETTE 1,0,0,0
  PALETTE 13,1,0,0
  PALETTE 14,0,1,0
  PALETTE 15,.2,.4,1
 FOR L = 3 TO 12 :PALETTE L,A,A,A: A = A +.07:NEXT
```

```
  COLOR 13,0:LOCATE 2,2 :PRINT Rd$
  COLOR 14,0:LOCATE 3,2 :PRINT Gr$
  COLOR 15,0:LOCATE 4,2 :PRINT Bl$
  COLOR 1,0 :LOCATE 6,4 :PRINT "Increment"
  LOCATE 8,6 :PRINT "+"; :PRINT USING set$;G/100
keymap:
  LOCATE 14,56 :PRINT "Red  Grn  Blu Bkgd."
  LOCATE 16,56 :PRINT " 7    8    9    -  "
  LOCATE 18,56 :PRINT " 4    5    6    +  "
  LOCATE 20,56 :PRINT " 1    2    3  Cycle"
  LOCATE 22,56 :PRINT "Exit x 3 Reset";
  LINE (15,37)-(104,71),15,B
  LINE(432,100)-(591,179),15,B
  LINE(432,116)-(591,116),15
  LINE(432,131)-(591,131),15
  LINE(432,147)-(591,147),15
  LINE(432,163)-(551,163),15
  LINE(471,100)-(471,163),15
  LINE(511,100)-(511,179),15
  LINE(551,100)-(551,179),15
scale1:
  LINE(119,2)-(599,96),3,BF
  LINE(119,2)-(599,96),1,B
 x1 = 119 : y1 = 2 : x2 = 167 : y2 = 57
  FOR L = 1 TO 10
    LINE(x1,y1)-(x2,y2),1,B
    PAINT(x2-1,y2-1),L+2,1
    x1 = x1 + 48
   x2 = x2 + 48
  NEXT
 x1 = 119 : y1 = 57 : x2 = 167 : y2 = 77
  FOR L = 1 TO 10
    LINE(x1,y1)-(x2,y2),L+2,BF
    x1 = x1 + 48
    x2 = x2 + 48
  NEXT
  LINE(119,2)-(599,96),1,B
  LINE(119,77)-(125,77),1
  LINE(593,77)-(599,77),1
scale2:
 FOR L = 10 TO 1 STEP - 1
   CIRCLE(215,141),20+L*18,L+2,,,.2
   PAINT(215,141),L+2
 NEXT
   CIRCLE (215,141),201,1,,,.2

resetit:
  lct = 17:COLOR 1,0
  FOR L = 1 TO 10
    R(L)=0:G(L)=0:B(L)=0:PALETTE L+2,R(L),G(L),B(L)
    LOCATE 2,lct : PRINT USING set$;0
    LOCATE 3,lct : PRINT USING set$;0
    LOCATE 4,lct : PRINT USING set$;0
    lct = lct + 6
  NEXT
```

Setting palettes 0 through 2 with the same color will create invisible Windows which are still fully functional.

The PALETTE command has four parameters, the ID# (0-31) and the RED, GREEN, BLUE values (0-1). For example:

PALETTE 0, .5, .5, .5 will produce a gray Background.
PALETTE 1, 0, 0, 0 will produce black Windows.
PALETTE 2, 1, 1, 1 will produce white Gadgets.

The PALETTEs should be set at the start of a program; however, they can be changed any time in a program, which is exactly what *Shade Select* is doing.

A1000 owners may prefer to ignore the keymap routine and substitute some keys with function keys in the Get.it routine. There are two IF/THEN statements for each key to be changed. (See Key Control Menu, page 66.)

Also change the third IF statement in the Get.it routine from

IF G$ > 0 THEN cycle

to

IF G$ > AND G$ < ":" THEN cycle.

These changes can be easily made after entering *Shade Select.*

Type in *Shade Select* from BASIC. Save it to disk before running it.

To begin, wait until the screen is fully drawn and the 10 palettes are set to zero or black. The program is now ready for input.

Shade Select uses the numeric keypad for input. There is an A500 and A2000 keymap on the screen.

The RED, GREEN, BLUE indicators are in the upper left corner. They can be toggled ON and OFF by their corresponding keys.

The Increment box shows

the current input value and whether it is positive or negative. The numeric keys (1-9) will increment in one-hundredths (0.01) any color which is turned on.

The Background can be toggled from white to black. The lighter hues are easier to see on a black background.

The Reset key will return all palettes to zero or black.

The Exit key must be pressed three times to exit the program. The screen will flash with each press of the key.

The Cycle key is used to move a desired color across the scales. The next color can then be generated, starting with the previous color.

There are two scales to monitor shade selection. The main scale at the top of the screen shows the values of each color. The leftmost bar is the active palette for input. The second scale consists of 10 ovals placed inside one another, with the active palette being the smallest oval in the center.

Experimentation is advised. You may be surprised at the results when creating various hues. For example, when going from dark gray to white the changes are drastic. But from yellow to white it's difficult to detect when there is a change.

Shade Select is helpful when developing a FOR-NEXT loop to assign the color values at a constant increment, as I did in the first loop of this program.

Try creating some 3-D looking shapes similar to the Oval scale. It can be tricky dealing with the PAINT command. I have found it easier to draw each shape with a common border color, then PAINT(x,y),color,border. Follow up by redrawing the same shape with the paint color. This will remove the border between each shade. □

```
Get.it:
  G$ = INKEY$
   IF G$ = "" THEN Get.it
   IF G$ = CHR$(13) THEN loop = 10:GOTO cycle
   IF G$ > "0" THEN  cycle
   IF G$ = "." THEN resetit
  IF G$ = "+" THEN
    plus = 1
    COLOR 1,0:LOCATE 8,6 :PRINT "+"
    GOTO Get.it
  END IF
  IF G$ = "-" THEN
    plus = -1
    COLOR 1,0:LOCATE 8,6 :PRINT "-"
    GOTO Get.it
  END IF
  IF G$ = "(" AND togR THEN
    vary = vary -1:togR = 0
    LOCATE 2,2:COLOR 13,0:PRINT Rd$
    GOTO Get.it
  END IF
  IF G$ = "(" THEN
    vary = vary +1:togR = 1
    LOCATE 2,2:COLOR 1,13:PRINT Rd$
    GOTO Get.it
  END IF
  IF G$ = ")" AND togG  THEN
    vary = vary -2:togG = 0
    LOCATE 3,2:COLOR 14,0:PRINT Gr$
    GOTO Get.it
  END IF
  IF G$ = ")" THEN
    vary = vary +2:togG = 1
    LOCATE 3,2:COLOR 1,14:PRINT Gr$
    GOTO Get.it
  END IF
    IF G$ = "/" AND togB  THEN
    vary = vary - 4:togB = 0
    LOCATE 4,2:COLOR 15,0:PRINT Bl$
    GOTO Get.it
  END IF
  IF G$ = "/" THEN
    vary = vary + 4:togB = 1
    LOCATE 4,2:COLOR 1,15:PRINT Bl$
    GOTO Get.it
  END IF
  IF G$ = "*" AND bkgd THEN
    PALETTE 0,1,1,1:PALETTE 1,0,0,0
    bkgd = 0 : GOTO Get.it
  END IF
  IF G$ = "*" THEN
    PALETTE 0,0,0,0:PALETTE 1,1,1,1
    bkgd = 1:GOTO Get.it
  END IF
  IF ext>1 THEN BEEP:SCREEN CLOSE 1:LIST:END
```

```
  IF G$ = "0" THEN ext=ext+1:BEEP
 GOTO Get.it

cycle:
  G = VAL(G$):COLOR 1,0
  LOCATE 8,7 :PRINT USING set$;G/100
  G = G/100*plus
 FOR L = loop TO 2 STEP -1
  R(L) = R(L-1):G(L) = G(L-1):B(L) = B(L-1)
 NEXT
  ON vary GOSUB vff,fvf,vvf,ffv,vfv,fvv,vvv
 IF R(1) > 1 THEN R(1)=1
 IF R(1) < 0 THEN R(1)=0
 IF G(1) > 1 THEN G(1)=1
 IF G(1) < 0 THEN G(1)=0
 IF B(1) > 1 THEN B(1)=1
 IF B(1) < 0 THEN B(1)=0
  lct = 17
 FOR L = 1 TO loop
  PALETTE L+2,1,1,1
  LOCATE 2,lct : PRINT USING set$;R(L)
  LOCATE 3,lct : PRINT USING set$;G(L)
  LOCATE 4,lct : PRINT USING set$;B(L)
  PALETTE L+2,R(L),G(L),B(L)
  lct = lct + 6:
 NEXT
  loop = 1 : ext = 0
 WHILE INKEY$ >"":WEND
GOTO Get.it

vff:
    R(1) = R(1)+G
  RETURN
fvf:
    G(1) = G(1)+G
  RETURN
vvf:
    R(1) = R(1)+G
    G(1) = G(1)+G
  RETURN
ffv:
    B(1) = B(1)+G
  RETURN
vfv:
    R(1) = R(1)+G
    B(1) = B(1)+G
  RETURN
fvv:
    G(1) = G(1)+G
    B(1) = B(1)+G
  RETURN
vvv:
    R(1) = R(1)+G
    B(1) = B(1)+G
    G(1) = G(1)+G
 RETURN
```

Understanding and Using the Command Line Interface

Wait for the Echo

By Richard Herring

If you want to do more with your Amiga than run commercial programs one at a time, you need to become familiar with AmigaDOS. Some of the essential AmigaDOS commands are available at the Workbench screen. You can format, copy, or rename a disk and work with files that have icons. But to really feel the power of AmigaDOS, you will need to use the Command Line Interface or CLI.

The CLI gives you access to multitasking and to programs (especially PD and shareware) that have no icons. More important, it gives you direct access to all those AmigaDOS commands in the :C directory of your Workbench disk.

Getting to those commands and being able to use them effectively and efficiently are, however, two different things. That's what this column is about. I encourage you to write to me with your questions, concerns, or suggestions about using the CLI.

Most AmigaDOS commands are powerful and flexible. I am often surprised, though, at the number of undocumented or poorly documented features. So the task we will set for ourselves in *Eye on CLI* will be to explore some of AmigaDOS's most useful commands. With a little luck, it will all come across more clearly than in the manuals. And I guarantee that we will hit a few features and tricks that the manuals don't mention.

We have been reviewing batch files and the EXECUTE command. This month, let's take an indepth look at some of the AmigaDOS commands that are designed for use in batch files. One of the simplest of these is WAIT.

The WAIT command tells your Amiga to suspend operation for a set period of time. Actually, it does not stop the computer totally, it only suspends activities in the current CLI window. If you are multitasking, running several programs at once with each one sharing the CPU, WAIT will not freeze those other activities.

WAIT is most often used to pause a screen display to give the user time to read a message. Last month, in my SS batch file, you saw how I use WAIT to provide opportunities to stop the execution of that batch file at certain points—before it fills up the RAM: disk and before it loads Workbench.

The best way to understand how WAIT works is to see it in action. Before we go on, turn on your Amiga and create this batch file, named WAIT-EXAMPLE, in the :S directory. Then type EXECUTE WAIT-EXAMPLE.

```
; This is the WAIT-EXAMPLE batch file.
ECHO "Wait 1 second"
WAIT
ECHO "Wait 5 seconds"
WAIT 5
ECHO "Wait 10 seconds"
WAIT 10 SECS
ECHO "Wait 15 seconds"
WAIT 15 SECS
ECHO "Wait 1 minute"
WAIT 1 MIN
ECHO "Wait 1 minute again"
WAIT 1 MINS
ECHO "The Amiga's clock has the following date & time:"
DATE
ECHO "At the prompt below, type UNTIL HH:MM"
ECHO "Select a time, in 24 hour format, that's a minute"
ECHO "or two after the time displayed above or you may"
ECHO "wait a long time"
WAIT ?
ECHO "Now I'll WAIT for a long time"
ECHO "To make me stop WAITing, hit (ctrl)c"
WAIT UNTIL 24:00
```

The first four WAIT commands show various ways to pause for 1 or more seconds. WAIT by itself defaults to a 1 second pause. WAIT followed by a number will pause for that number of seconds. If you want to be verbose, you can follow the number with either SEC or SECS. The Amiga sees them as exactly the same. So WAIT 1 SECS or WAIT 100 SEC would both be fine.

To pause for several minutes, you could use WAIT 180 or you can specify minutes with the WAIT 3 MIN command. Again the keywords MIN and MINS are identical as far as your Amiga is concerned.

Next, the WAIT-EXAMPLE batch file gives you the flavor of the UNTIL keyword. The required format is WAIT UNTIL HH:MM. That's hours:minutes, with hours in the 24-hour format, so 10:30 PM is 22:30. Both hours and minutes must be 2-digit numbers. 8:30 won't work, nor will 12:5.

You cannot add seconds to the time. If you type the command WAIT UNTIL HH:MM:SS, you will get a "Time should be HH:MM" message. The WAIT UNTIL HH:MM is just not accurate enough to accept seconds. The command WAIT UNTIL 22:30 will pause until sometime between 10:30 PM and 10:31 PM. You do not have control over where in that 1 minute time span the WAIT command will end.

As is true for most AmigaDOS commands, WAIT followed by a space and a question mark will display the argument template for the command:

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Circle #269 on Reader Service Card

```
,SEC=SECS/S,MIN=MINS/S,UNTIL/K:
```

and pause for you to enter an argument. Your argument may be as simple as tapping the RETURN key to pause for the default 1 second.

The comma that begins WAIT's argument template shows that an optional number, with no keyword, can follow the WAIT command. The argument template also tells you that the keywords SEC and SECS, MIN and MINS are alternatives (=) and that they are switches (/S). A keyword that is a switch takes no argument. The last keyword that the argument template displays is UNTIL, which requires (/K) that an argument be given.

You will learn, as you see more and more batch files, that WAIT is most often used to freeze a screen display for a few seconds. But that common usage is deceiving. The best way to pause a screen display in many cases does not involve the WAIT command at all. And the real power of WAIT is not in freezing the display, but in running timed applications. Let's look at timed applications first.

Scenario: Returning home from work, you routinely call a local Amiga bulletin board to read all the new messages and gossip about the Amiga. You usually capture the messages in a buffer, sign off the BBS, and then compose all your blistering responses. Later you call back and upload your responses. Now imagine using WAIT to save time and energy. You write a batch file that begins with WAIT UNTIL 02:30. Then, in the early AM while you're in REM, the batch file loads a communications program that runs from a script. The script file directs the program to call the BBS, download all new messages into the capture buffer, sign off, and quit. The batch file continues with WAIT UNTIL 07:00, by which time you're singing in the shower. It then sends all those new messages to your printer, which dutifully bangs them out on paper. On your way out of the house, you rip off the printout to compose your witty responses at lunch.

For any task that you want your Amiga to perform unattended at a specific time, WAIT is the ticket. It can also be used in a multitasking situation to write reminders to yourself and echo them to the screen at the appropriate times.

A few paragraphs back, I said that the WAIT command is sometimes not the best way to pause a screen display. Instead, try ECHO, the next AmigaDOS command we'll investigate. WAIT's strength is that it pauses for a specific period. But if you want to display several lines of information, how much time will you give the user to read them all?

Why not let the user decide? Instead of WAIT 15, try ECHO ? in your batch file. The ECHO command only takes text strings, it really doesn't have an argument template to display at the question mark. So ECHO ? will just make the cursor drop to the next line, display a colon (the final character of an argument template), and wait for your input. Execution of your batch file will not continue until you hit RETURN. Now the user can take as much time as he wants to read your screen messages. This is also a good tool to debug lengthy batch files as you write them.

The ECHO command is typically used to display messages on your Amiga's monitor. It is similar in that regard to BASIC's PRINT statement. Although that's how you will see it used 99 percent of the time, we will see how it can be much more versatile (like as an interactive substitute for WAIT above).

ECHO, followed by a text string, will send that string to the currently active output stream—the screen, a disk file, a parallel printer, or other output device. If the string has no spaces, it need not be enclosed in quotes. If the string includes leading, embedded, or trailing spaces, quotes are required.

Many batch files use one ECHO after another to display several consecutive lines of text. That is absolutely unnecessary. Try typing the following command at the CLI 1) prompt:

```
ECHO "Using a single ECHO command, I can display several lines of text. This is more efficient than using consecutive ECHO commands, because ECHO only has to be loaded from the :C directory one time. But watch out for word wrap."
```

In fact, ECHO can handle 255 characters. Counting the beginning and ending quotes, that leaves you 253 characters of text (including spaces) to display with a single ECHO command.

The characters that can be used in an ECHO command are limited, similar but not identical to filenames. Valid filenames do not allow the / or: characters, but these are okay in ECHO strings. If you want to display an asterisk (*) or double quote (") as part of an echo string, it must be preceded by an asterisk. Thus

```
ECHO "*"Hi There!*""
```

will display "Hi There!" (with the quotes) on your screen.

The ECHO command followed by a RETURN will do nothing visible on your screen. If you want to insert a black line, the simplest command is ECHO "". No space is required between the double quotes.

Often, you will want to ECHO an important message to the screen. To help get the user's attention, you may want to clear the screen first. You could include the line

```
ECHO ""
```

23 times in your batch file, but, as usual, there is an easier way.

The CLI uses the Amiga's console device driver. Because that driver is based on ANSI (American National Standards Institute) standards, it can use control and escape codes to control the display. Let's do a demonstration. Turn on your Amiga. At the CLI prompt, hold the Control key, type the letter 1, and hit RETURN. This should clear the screen (referred to as a "form feed" by some) and move the CLI prompt to the upper left corner.

Now, how can we use this trick in a batch file to avoid typing ECHO "" 23 times? We need to send (ctrl)l as a character in our batch file. All we need is a line that says:

```
ECHO (ctrl)1
```

Let's build a batch file right from the CLI prompt to demonstrate our "clear screen" escape sequence.

At the CLI prompt, type:

```
COPY * TO CS.BAT (ret)
ECHO "First, we'll put some text on the screen to make
sure it's not empty. Hit RETURN when you are ready to
clear the screen." (ret)
ECHO ? (ret)
ECHO (ctrl)1 (ret)
(ctrl)\
```

Some explanations are in order. (ret) means for you to hit the RETURN key. (ctrl) means hold the CONTROL key while you type the following character–either the letter l or the backslash. (Typing (ctrl)l will appear as L on your screen.) What you are doing here is copying from *, which is the screen, to our sample batch file. Everything you type goes into the batch file until you enter an "end-of-line" character, the (ctrl)/. (You can edit any line before you hit RETURN, but not after.)

Now execute CS.BAT. Remember that the EXECUTE command should be in the :C directory and CS.BAT must be in the current directory or in the :S (batch) directory.

You'll see the message contained in the first ECHO string. Then the batch file's execution will pause and wait for you to hit RETURN. Presto, your screen is clear. At this point, you would normally continue your batch file, having it display whatever important message you want the user to read. So now we know how to send control codes from a batch file.

You can also send escape codes from a batch file to control the appearance of your Amiga's display. The characters to introduce an escape code are (esc)[. If you create a batch file from the CLI, as we just did, the (esc) will appear as a carat followed by a left bracket. This is followed by typing another left bracket.

Clearing the screen was just the beginning. Using escape codes will help you to really dress up text displayed from batch files. Whether you ECHO single lines of text, or TYPE files that will fill the screen, escape codes can help you grab the user's attention.

In a future *Eye on CLI*, we will study all the control and escape codes in excruciating detail. For now, let's end with one more little trick. Because different editors handle the Escape key in various ways, let's create another batch file from the AmigaDOS prompt:

```
COPY * TO INV.BAT (ret)
ECHO "This is the result of a regular ECHO." (ret)
ECHO "(esc)[7m" (ret) (This will appear as [[7m.)
ECHO "This gives a bit more dramatic effect." (ret)
ECHO "(esc)[0m" (ret) (This will appear as [[0m.)
ECHO "Now we're back to normal." (ret)
(ctrl) \
```

There's lots more. And don't forget, you can participate in this. Write me (P.O. Box 154, Tallahassee, FL 32302) with your suggestions or questions. Any published hints earn you a free PD disk. □

Software and Applications for the Small Businessman

By Ted Salamone

Last issue we dealt heavily with graphic and animation software. In this installment we'll emphasize more traditional business applications. After all, the best creative tools will go for naught if your financial and marketing considerations and needs aren't addressed properly.

CHARTING YOUR ACCOUNTS

A general ledger package like the new release from Business Electronics Software & Technology (B.E.S.T.) is a piece of "must have" software for any business, as it allows you to track transactions, costs, and revenues as they occur. Version 2.0 is a full-featured, easy to learn and use financial application with the best documentation in the business. It is also one of the most bug free, stable programs in any market! (Just the kind of security you need when dealing with your company's financial matters.)

By creating a Chart of Accounts and identifying a fiscal calendar, you can enter and edit all sales, Accounts Payable, Accounts Receivable, and other transactions. In other words, you set up a series of numbered accounts (Chart of Accounts) to which transactions are posted. For instance, postage expenses for May could go into account 1560, for the 3rd fiscal period (if the fiscal year started in March).

By capturing summary information for these account transactions, you can easily create Income Statements and Balance Sheets. A good GL, like this one, will even let you customize report contents, format, and headings. That way you can provide data to a bank for a loan, do your taxes, or identify which resources can go towards investments and which resources must be plowed back into the company.

Besides data in the financial statements mentioned before, critical information which may be pulled from the system includes inventory valuation, liabilities, owner's equity, fluidity, and expenses—both direct and indirect.

This stand-alone, non-copy protected application, with complete setup instructions, sample reports, sample Chart of Accounts structure, tutorials, mouse control, and pop-up menus, makes an ideal entry level vehicle for small and midsize firms not yet ready for B.E.S.T.'s more encompassing, fully integrated *Business Management System.* Once ready to expand, however, you'll find that the move up does not require changes to historical or current data, reports, account structures, or anything! The move is seamless because the stand-alone GL is identical to the GL in the full system. Once integrated, though, you'll be able to automatically pass Accounts Receivable, Accounts Payable, Purchasing, and other journal transactions to the GL. No re-keying (into the GL) is necessary.

SPEAKING OF INVESTMENTS

Software Advantage Consulting has written and published *Investor's Advantage Version 2.0* for stock market portfolio management and investment analysis.

This non-copy protected application, actually a series of compiled BASIC modules called from a pulldown menu, is written in Absoft BASIC. That immediately made me wary, as I remembered the sluggish and buggy tendencies of other applications written in the same language. Not to worry, though; SAC did a sterling job keeping this product bug free. They also did a splendid job in the performance category; *IA* really flies where similar ones fail—in the graphing mode. Its overall speed and performance, including module loading, are exemplary.

Featurewise very rich, it still manages to maintain an easy to master interface. Other than a single floppy 512K Amiga, the only requirement is a Hayes-compatible modem for downloading stock market data. A hard drive and a printer capable of 132 column (condensed) mode output makes life a lot easier.

IA is set up to cover the New York Stock Exchange, AMEX, Philadelphia/Baltimore/Washington, Midwest, OTC (Over The Counter), NASDAQ, Pacific Coast Stock Exchange, mutual funds, stock market indices, and Canada (Toronto and Montreal).

Data can be downloaded automatically via modem from the Warner Computer Systems Stock Market History database, or manually entered and updated. Up to 500 issues can be tracked, distribution of stock splits is accommodated, and information can be exported to a spreadsheet.

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taneously for "one-stop" comparisons and analyses. The program's overall concept is to present the information cleanly and effortlessly so you can spend time doing the analysis, not wasting time with the mechanics of getting the data downloaded or the graphs and reports produced.

While this $99.95 program has a good deal of sophistication, market novices can put the basics to good use, growing into the higher end features such as adjusting the stochastics' or Wilder's criteria. (In the beginning the defaults are just fine.) Recommended as a way to develop and protect those excess or windfall profits.

RICHARD THE *LIONHEARTED*

Next stop is merry ole (New) England and a set of programs which allow businesses to forecast sales revenue and units over time. These projections form the basis of building inventory, seeking capital for expansion, or scaling back if the future does not appear rosy. Advance notice makes it easy to be prepared; no last minute layoffs or firings, no last minute scrambles for additional funding or production capacity. Used correctly, these programs will make management tasks manageable and answer questions such as, "How much of Item X will I sell in 1989?"

Lionheart Press writes, publishes, and distributes a series of technical programs relating to time series forecasting and marketing. We'll look at two of their applications, *Sales and Market Forecasting* and *Forecasting and Time Series.*

First, a little background. Each of these applications is really a grouping of 12 or more (small) standalone routines originally written in BASIC for other computer systems. The Amiga versions have been ported with little concern for the typical Amiga user.

As such they are accessed through extremely limited to non-existent interfaces. Forget about menus altogether; never mind pulldowns; don't expect to use a mouse, or anything but a keyboard or a datafile read for information entry.

Each routine comprising the larger "application" is launched via its own icon. (At least that much is Amigalike.) From there it's a matter of answering terse prompts and pressing the RETURN key. Without a doubt, it can be said that these are the least friendly applications ever to run on the Amiga.

If you are willing to look past the abysmal front end, you will find a powerful series of forecasting and analysis tools not available to the Amiga from any other quarter.

The documentation, while detailed, is also less than award winning. Page after page of technical data, formulas, and basic black and white charts comprise the sum total of both manuals. There are no specific instructions for operating the routines (on any computer), nor are there screen shots. (The screens aren't worth reproducing anyway.)

An addendum explains the general purpose of each routine in the application. After reading a few of the descriptions, perusing the manuals, and running the routines, you realize that they are not for "everyman" or casual use. Hence the lack of attention to building an Amiga interface can be partially explained.

While these are not true vertical market applications, only experienced specialists should use them. Anyone with a forecasting or statistics background should feel right at home. Those are the only types who can make sense (and use) of the routines without a heavy investment in learning forecasting techniques and acquiring a statistical background.

In addition to data entry and manipulation, users can run a moving average smoothing program, perform time series correlation analysis, or test for frequency of occurrence in a dataset.

Several regression methods are provided, including the ability to fit a seasonal series with a trend, to identify a polynomial trend in a non-seasonal series, and to fit a seasonal series with a non-linear trend. These are simple univariate regressions.

More advanced, multivariate regressions can handle a nearly unlimited number of variables. One of the routines even allows users to develop a variable as a function of different time series sequences.

At the low end, forecasting routines provide single and double moving average smoothing and single and double level exponential smoothing.

The Box-Jenkins methodology is supported in several routines, and it is possible to calculate probabilities for cumulative normal, t, chi-square, and F distributions. The latter tools are very handy for validation of hypotheses involving test market population samples. (Sample 100 typical Amiga users to see if they will buy XYZ spreadsheet at $195.00, and spread the conclusions across the general Amiga software marketplace. A great way to refine a product and attempt to ensure its success.)

There are graphing routines which produce the simplest level of black and white line type charts. X and Y axis scales are not displayed; the routines cannot even depict negative numbers. Therefore, their usefulness is limited to nothing more than visual verification of data points in the file to be used/being used.

So what do we have here? A grouping of technically powerful and sophisticated routines capable of identifying markets, refining products through sample population analysis,

For more information about the products mentioned in this column, contact the following companies:

B.E.S.T.
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and forecasting potential sales of new and existing products with adjustment for trends, seasonality, market anomalies, and anticipated conditions.

On the other hand, the applications are definitely not for the uninitiated and they lack a graphic, intuitive interace. Therefore, these applications are strictly for specialized use and should be considered if no other tools are available (like another computer with more user friendly programs).

HARDWARE

Commodore sells external Amiga floppy drives. They are made of plastic, have an extremely short cable, and are rather large. They are also reliable and widely distributed, so why would anyone want a floppy drive from a third party manufacturer?

Well, there are actually several reasons why you would want the Master 3A from Surfside Components International.

First, it is completely compatible with all models of the Amiga, has an on/off switch, and is a functional match for the Commodore 3.5 inch 880K drive. Like the Commodore unit, the Master 3A is powered by the Amiga itself.

The 3A is wrapped in a sturdy steel case that matches the Amiga's color scheme. It is about two-thirds the size of the Commodore unit and is equipped with a generous length of cable for connection to the CPU. These features make it a better fit in tight quarters and, more important, allow it to be placed on either side of the monitor, or elsewhere for that matter.

Most important, however, is the built-in output connector. Because of this extra port additional floppy drives can be added, up to the Amiga's limit of four. This is particularly useful for businesses where online data must be downloaded or speedy disk duplication is needed. For example, you could download data from CompuServe onto a dedicated drive while also running a 2-floppy application; or you could use *Marauder II* to copy from one source disk to 2 or 3 destination disks at the same time.

The manual is adequate for installation, as the drive just plugs into the CPU connector. Nothing else needs to be done. The manual goes into some detail on disk duplication, just in case your Amiga manual isn't around. Concerning options such as the 3rd and 4th floppy drives, it indicates that a special version of the 3A is required – one with an external power supply. It seems the Amiga can only power one external drive on its own. Another option mentioned is the Master 5A 5.25 inch floppy drive, a unit which can be added directly to a 3A via the connector and programmed to read/write IBM PC formatted data files.

As an added bonus, a disk with several public domain programs is included, the best being a quite useful virus protection utility.

Overall, the Master 3A is an excellent value and a solid performer. Look into it when expansion time looms.

Until next time, keep computing; and write me at Salamone & Associates, 42 Canterbury Road, Bridgeport, CT 06606. ☐

MAILBOX
Continued from page 28

```
ON e GOSUB PreChange,Delet,Previous,Nextt,Label
RETURN Main

PreChange:
o1=s(1):o2=s(2):GOSUB Change
IF o1<>s(1) OR o2<>s(2) THEN
  sf=s(1):sl=s(2):GOSUB clock
  IF i<>rend THEN
    FOR k=i TO rend:recno(k)=recno(k+1):NEXT
    recno(rend)=recno
  END IF
  GET 1,recno(rend-1)
  IF s2>s(2) OR (s2=s(2) AND s1>s(1)) THEN recno(i)=recno:RETURN SearchMenu
  Find sf,sl
  FOR j=rend TO i+1 STEP -1:recno(j)=recno(j-1):NEXT
  recno(i)=recno
END IF
RETURN SearchMenu

Change:
WINDOW OUTPUT 3:COLOR 2,5:CLS:WINDOW OUTPUT 2:COLOR 2,0
FOR j=1 TO 7:LOCATE 2*j,3:PRINT USING"#_.";j:NEXT
WINDOW OUTPUT 3:CLS:PRINT:PRINT" Make changes (Y/N)?":a=""
WHILE a<>"Y" AND a<>"N" AND (VAL(a)<1 OR VAL(a)>7):a=UCASE$(INKEY$):WEND
IF a="Y" THEN
  CLS:PRINT:PRINT" Select line to change
  WHILE VAL(a)<1 OR VAL(a)>7:a=UCASE$(INKEY$):WEND
END IF
IF a<>"N" THEN
  j=VAL(a):WINDOW OUTPUT 2
  LINE (191,16*(j-1)+7)-STEP(8*fs(j),9),7,b
EnterRec j:LINE (191,16*(j-1)+7)-STEP(8*fs(j),9),0,b:GOTO Change
END IF
WINDOW OUTPUT 2:COLOR 0,0:FOR j=1 TO 7:LOCATE 2*j,3:PRINT "  ":NEXT
GOSUB WriteRec:RETURN

Delet:
WINDOW OUTPUT 3:COLOR 2,5:CLS:COLOR 2,4
FOR f=1 TO 2:g=12*f-5:h=(g-2)*8:PUT (h,5),box1,PSET:NEXT
LOCATE 2,8:PRINT"DELETE"TAB(20)"CANCEL
FOR j=1 TO 2000:NEXT
WHILE MOUSE(0)>-1:WEND
IF INT((MOUSE(1)-40)/96)=0 THEN
  recno=recno(i):FOR j=1 TO 7:stat(j)=CHRd:NEXT:GOSUB WriteRec
  rend=rend-1
  IF i<>rend+1 THEN
    FOR k=i TO rend:recno(k)=recno(k+1):NEXT
    recno(rend+1)=recno
  END IF
  IF i<>1 THEN i=i-1
  recno=recno(i):GOSUB ReadRec:GOSUB ListRec
END IF:RETURN SearchMenu

Previous:
i=i-1:IF i=0 THEN i=rend
recno=recno(i):GOSUB ReadRec:GOSUB ListRec
RETURN SearchEnd

Nextt:
i=i+1:IF i=rend+1 THEN i=1
recno=recno(i):GOSUB ReadRec:GOSUB ListRec
RETURN SearchEnd

Label:
FOR j=1 TO 6:l=LEN(s(j))
  WHILE MID$(s(j),1,1)=" ":l=l-1:WEND
  ss(j)=LEFT$(s(j),1)
  IF LEFT$(ss(j),1)=CHRn THEN ss(j)=""
NEXT
LPRINT ss(1)" "ss(2):LPRINT ss(3):LPRINT ss(4)
IF LEN(ss(6))=6 THEN ss(6)=LEFT$(ss(6),3)+" "+RIGHT$(ss(6),3)
LPRINT ss(5)SPC(3)ss(6):LPRINT:LPRINT
```

```
IF e THEN RETURN SearchEnd
RETURN

Labels:
WINDOW OUTPUT 3:COLOR 2,5:CLS:COLOR 2,4:e=0
FOR f=1 TO 4:g=12*f-5:h=(g-2)*8
  PUT (h,5),box1,PSET:LOCATE 2,g+1:PRINT title3(f)
NEXT
WINDOW OUTPUT 2:COLOR 2,0:FOR j=1 TO 2000:NEXT
WHILE MOUSE(0)>-1:WEND:m=INT((MOUSE(1)-40)/96)+1:k1=1:k2=rend
IF m=2 THEN GOSUB FindWhat:k2=i
IF m=3 THEN GOSUB FindWhat:k1=i
IF m=4 THEN GOSUB FindWhat:k1=i:GOSUB FindWhat:k2=i
COLOR 2,5:CLS:IF k2>rend THEN k2=rend
GOSUB clock
FOR k=k1 TO k2:GET 1,recno(k):GOSUB Label:NEXT
RETURN Main

clock:
WINDOW OUTPUT 3:COLOR 0,0:CLS:PUT (28,7),watch,PSET
RETURN

FalseStart:
RUN

SUB EnterRec (i) STATIC
SHARED setcity,setprov,CHRn
WINDOW OUTPUT 3:COLOR 2,5:CLS:PRINT
PRINT" Enter "typestat(i);:LINE INPUT": ",s
WHILE LEN(s)>fs(i):LINE INPUT" String too long. Re-enter: ",s:WEND
IF s="" THEN
  IF i<>4 AND i<>5 THEN s=CHRn
  IF i=4 THEN s=setcity
  IF i=5 THEN s=setprov
ELSEIF i<5 THEN
  s=UCASE$(LEFT$(s,1))+RIGHT$(s,LEN(s)-1):j=2
  WHILE INSTR(j,s," ")<>0
    j=INSTR(j,s," ")+1:MID$(s,j,1)=UCASE$(MID$(s,j,1))
  WEND
  IF i=4 THEN setcity=s
ELSEIF i=5 OR i=6 THEN
  s=UCASE$(s):IF i=5 THEN setprov=s
END IF
IF i=2 THEN
  j=INSTR(s,"C/o"):IF j THEN MID$(s,j,3)="c/o"
END IF
WINDOW OUTPUT 2:COLOR 2,3
LOCATE 2*i,25:PRINT SPACE$(fs(i))
stat(i)=s:LOCATE 2*i,25:PRINT s
END SUB

SUB Sort STATIC
SHARED rend,ln
IF rend<3 THEN EXIT SUB
FOR i=1 TO rend:GET 1,i:s1(i)=s(1):s2(i)=s(2):NEXT
  FOR k=1 TO rend-1
  jtop=k:top1=s1(k):top2=s2(k)
  FOR j=k+1 TO rend
    IF s2(j)<top2 THEN
      top2=s2(j):top1=s1(j):jtop=j
    ELSEIF s2(j)=top2 THEN
      IF s1(j)<top1 THEN top1=s1(j):jtop=j
    END IF
  NEXT:SWAP recno(k),recno(jtop):SWAP s1(k),s1(jtop):SWAP s2(k),s2(jtop)
NEXT
END SUB

DATA ENTER,SEARCH," LIST",PRINT," QUIT"
DATA " CHANGE"," DELETE",PREVIOUS,"  NEXT"," PRINT","  EXIT"
DATA " ALL",A to ?,? to Z,? to ?
DATA First Name,12,Last Name,22,Address,28,City,14
DATA State/Prov.,4,Zip/Postal Code,6,Phone,12
```

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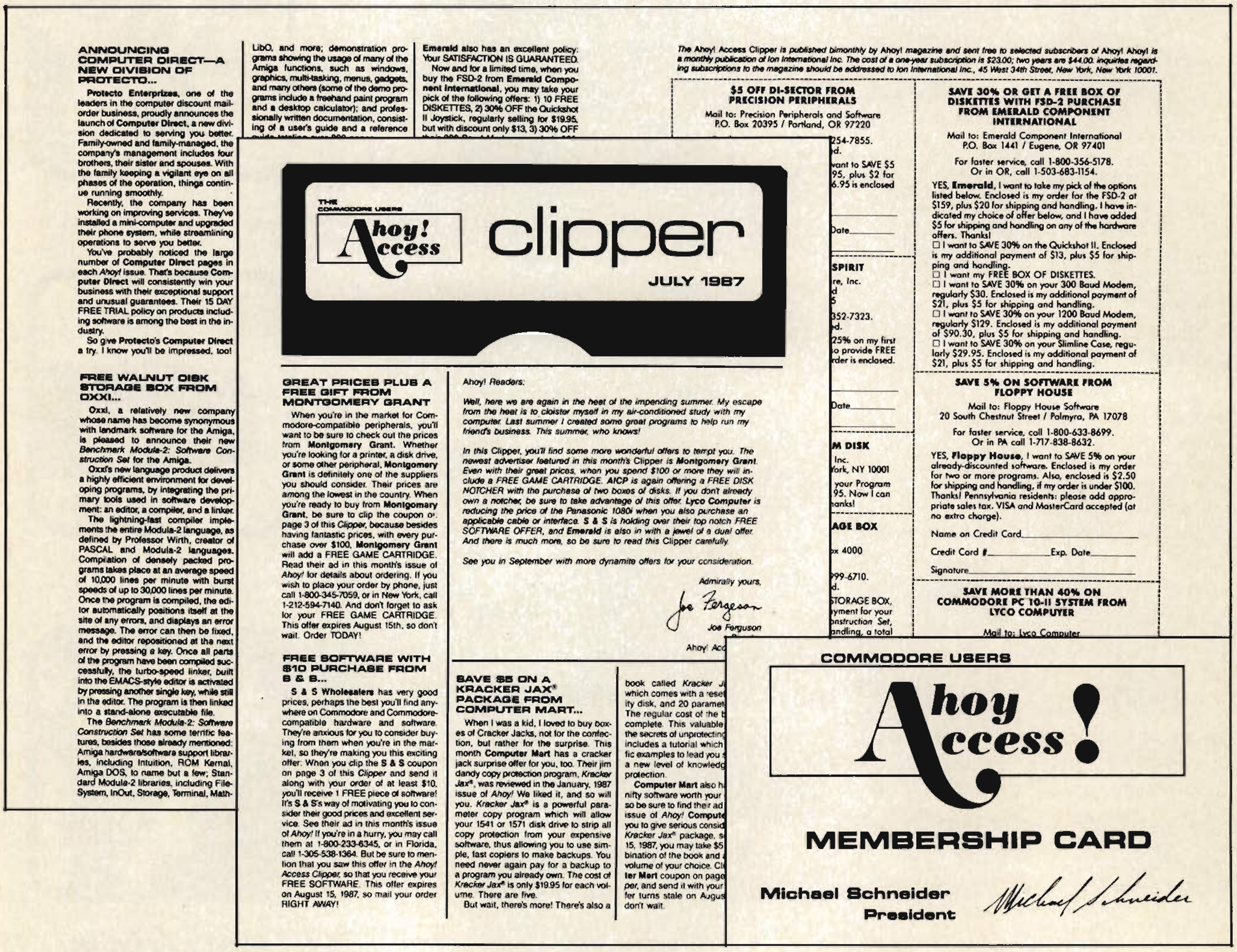
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Continued from page 62
sembling, a commercial program may be a violation, in which case you shouldn't do it.)

But *DSM*, or any other disassembler, can only give you a part of the programmer's original listing. I'll borrow an example from Eugene Mortimore's *Amiga Programmer's Handbook*, Volume I. The programmer may for example have written:

```
MOVE.L (A1),D1                  ;first node
scanLoop:
MOVE.L D1,A1 ;make look-head to next
MOVE.L (A1),D1      ;look-ahead to next
BEQ.S ScanExit                  ;end of list
(body)
BRA.S scanLoop
scanExit:
```

DSM can't give you his comments, the internal documentation that is so much more significant in assembler than in BASIC. What *DSM* will produce for you is:

```
    move.1 (a1),d1
scanLoop:
    move.1 d1,a1
    move.1 (a1),d1
    beq.s scanExit
    (body)
    bra.s scanLoop
scanExit:
```

Even that much of a listing can't always be accomplished. *DSM* must work with the raw materials at hand. *DSM* can only generate assembly language source code listings that contain the names of functions or subroutines (scanLoop, scanExit) if Wack-readable symbol information is placed into the program when the program is compiled or assembled.

When you buy *DSM*, be sure to get the 9/01/88 update. It does a better job of disassembling programs with lots of symbol names. It also handles illegal symbol names by replacing illegal characters with a period and flagging the name with an "I".

From the single command line you enter at the CLI prompt, *DSM* produces an assembler-ready source code listing. *DSM* starts with the first statement in the program, which it assumes will be code, not data. As the first fragment of code is disassembled, *DSM* notes all references to other code fragments. When the current code fragment is disassembled, *DSM* moves on to another code fragment that it has noted. You'll observe from the little bit of screen information that is displayed as *DSM* disassembles that it is jumping around in the program.

When all code fragments are disassembled, the program statements that remain are assumed to be data. This conservative method guarantees that disassembled code is really code and not data. But it may leave some code untouched, to be disassembled as data. So we come to *DSM's* options.

You learn to use *DSM* quickly because it offers just six options. Specifying "-e" on the command line invokes the expert mode of disassembly—the most frequently used option. *DSM's* expert system reevaluates any code segments remaining after regular disassembly for binary sequences that look like valid 68000 instructions. It attempts to disassemble those segments normally. If successful, *DSM* treats the segment as code; if unsuccessful, as data. Labels in these "expertly defined" segments will begin with an "E", prompting you to double check. (Labels in segments guaranteed to be code begin with an "L".)

An alternative to the "-e" option is the "-f" option. This allows you to direct *DSM* to disassemble code fragments found at the locations you specify in an offset file. Your offset file is regular ASCII text and may contain all the comments you wish. The "-f" option is valuable if you are familiar with the code being disassembled.

The "-h" option instructs *DSM* to place comments after the disassembled instructions. These comments contain hex-dump information showing the offset from the beginning of the segment. This can help you find code fragment offsets for building offset (-f) files.

The second most commonly used option is "-o" which allows you to specify the name and path for the disassembled output file. Without this, *DSM* will send the output to the drive and directory of the program being disassembled, and use that program's name with ".dsm" appended as the name of the output file.

If you are working with a large program or want each segment saved to a separate file, use the "-s" option. By itself, "-s" saves different segments to sequentially numbered files. Paired with a number, "-s" specifies the maximum number of blocks for any file. If a segment is long, it will be saved as a series of files.

Last, the "-v" option logs error messages to a verification file. Note that it won't pick up error messages that occur before disassembly starts—like the message warning you that you're about to overwrite an existing disassembly of the same program.

Serious use of *DSM* holds the potential to have you lusting after more RAM. OTG suggests that you have 512K to run *DSM*, which itself requires about 77K. Where you really need the RAM is for disassembled code. Due to the way *DSM* follows the program's logic, rather than stepping sequentially through the code, it needs the whole program in memory. Disassembling the 77K *DSM* program will require that you have well over half a megabyte of RAM free.

As a rule of thumb, you can plan on the disassembled listing being 6 to 8 times the size of the original executable program. One 19K program, for instance, generated a 161K listing.

DSM not only does a fine job of disassembling your program, it also points out many of the problems you may find. The longest section of the manual—8 pages—is dedicated to listing and describing error codes and messages. Each error number is explained in enough detail to actually be useful to the user.

The 11 possible warnings alert you to minor problems and to situations where *DSM* may run out of room or overwrite a file. The 10 non-fatal errors relate to the disassembly of code fragments—like a byte sequence that does not represent a valid instruction. The 18 fatal errors cause *DSM* to stop its work. These errors may be minor—like when you invoke *DSM* with an invalid syntax; or they may be major—like when the executable program was not compiled correctly.

OTG developed *DSM* with an eye toward compatibility with the Amiga assembler—assem. To the extent that any other assembler you use follows the assem standard, it will be compatible with *DSM*. Inovatronics' *CAPE 2.0* assembler is reported by OTG to cause

one minor problem for *DSM*. From *DSM's* perspective, the Manx assembler has limitations related to always optimizing code, handling back-to-back single quotes, and linking segments.

Using *DSM* with a public domain assembler will almost surely cause you to end up doing a lot of editing by hand. Still, you can try Charles Gibbs' A68000 assembler, *A68k*, as well as the macro assemblers *Asm* and *Asm68kl.1.* (These appear on Fred Fish disks 110, 50, and 81 respectively.)

If you want to see just how compatible your assembler is with *DSM*, you can assemble the verification file on the *DSM* disk. This file uses every legal 68000 instruction type with every valid addressing mode. (That's a total of over 1450.) Disassemble the resulting program with *DSM* and compare the original verification file to the listing you just produced. This will show if you are going to run into problems.

For a hint of just how powerful *DSM* is, you might try one of several public domain disassemblers. A simple one is *Disassm* by Bill Rogers (Fish 27). Or, there's Greg Lee's *DIS*, which is written in 68000 assembler (Fish 128). None of these are as slick, accurate, or complete as *DSM*, but they'll give you the idea. Obviously, if you're going to disassemble, modify, and reassemble/relink a program, you'll want a highly accurate disassembler to avoid as much post-disassembly editing as possible.

If you own either Metacomco's *Toolkit* or Abacus' *AssemPro*, your software already includes a disassembler. Based only on a casual look at both of those programs, I'll suggest that you may still want to take a look at *DSM*.

I asked OTG's David Hankins whether he sees symbolic debuggers (such as Manx's *db* or MetaScope's *debugger)* as competing with *DSM*. His response was interesting. In brief, Hankins sees disassemblers and debuggers as complimentary tools. The disassembler isn't directly used to exterminate bugs in programs and the debugger can't easily produce an assembler-ready listing of a complete program. But using both, you could "take a public domain program, generate a source code listing with a disassembler, and then use the debugger to track down any bugs which might exist. Then, edit the source code to fix the bugs and come away with an improved product."

One other novel use for *DSM* comes (indirectly) from Wes Howe. He suggests that *DSM* might be used to translate programs developed with Manx C or Lattice C into assembly language. *DSM* should even pick up the variable names used in the original C program. This would offer a workable solution to translating a program from a high level language to assembler. After some optimization of assembler routines in the translated listing, you could gain the speed and compact code that assembler offers without recoding from scratch.

Occasionally, you may run into an old program that refuses to run with your expanded RAM installed. A utility included with *DSM*, called ATEM, may be the answer. ATEM allows you to force program segments to load into a particular type of memory—CHIP, FAST, or PUBLIC. To fix that old program, you may only have to force DATA segments to load into CHIP memory where the graphics chips can be guaranteed to find them. ATEM is a pleasure to use. It lists the program's segments, their type (CODE, DATA, or BSS), and memory type. Just pick the segment you want, and specify the type of memory to change to.

DSM comes on a single non copy protected disk. The package includes a 60-page manual (with 39 pages of actual text) in a ring binder and an update file on the disk. The manual's approach is to get you started immediately, which is great since that's exactly what most of us do anyway. It has a Table of Contents, but no index, which isn't much missed since the program's operation is so simple.

Firing up *DSM* does not require familiarity with the 68000 instruction set or Amiga load structure. The manual makes no attempt to familiarize you with assembly language programming, but it does refer you to four books and a series of articles.

OTG recognized that some industrious programmers might want to use *DSM* to disassemble itself for modification. Rather than warn you away, the manual discusses many of the potential problems and tells you how to solve them.

OTG's warranty is mostly fair. If you don't agree to it, return the package for a refund. In short, it requires that only the purchaser use the software and only on one machine at a time. You use *DSM* at your own risk and using it to violate the law is a no-no. I have to admit that I'm not crazy about the limitation that only the purchaser can use the program. After all, the family that computes together....

DSM comes with a 90 day warranty to perform as documented. If you find a defect, notify OTG. They'll either resolve it in 90 days or allow you to return the package for a refund. Upgrade prices are tentatively set for $10 for minor and $20 for major upgrades. The first person to report any defect (bug) will receive the next upgrade free. It's pleasant to find a company that really wants to hear about your problems with its product.

Well, maybe not "hear." More like "read" about your problems. OTG doesn't include its phone number in the manual. Your options are to write a letter or to leave a message on CompuServe, BIX, or PeopleLink. My experience was that such messages are promptly answered.

Speaking of upgrades, let's take a look at what the future holds for *DSM*. OTG promises upgrades in two important areas. The first will allow *DSM* to disassemble 68010, 68020, and 68881 instruction sets. The second will power up *DSM* to handle programs that use overlays, which it cannot do in its current version.

OTG makes the bold claim that *DSM* is the "most powerful disassembler currently available for the Amiga." While this is not a comparative review, I can say that *DSM* is sure to please both experienced and budding programmers. For that matter, it's a great addition to the software library of any serious Amiga user who's determined to learn more about what makes the Amiga tick.

OTG Software, 200 West 7th Street—Suite 618, Fort Worth, TX 76102).

—Richard Herring

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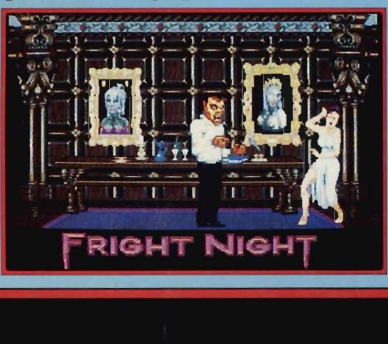
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